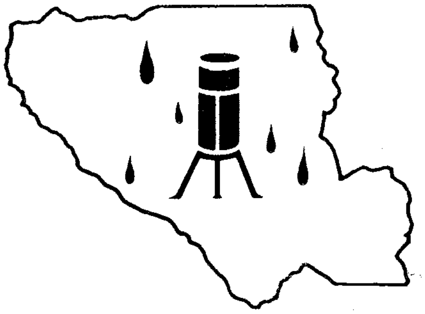
HYDROLOGIC ATLAS

SANTA CLARA COUNTY
CALIFORNIA



SANTA CLARA COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT
1963

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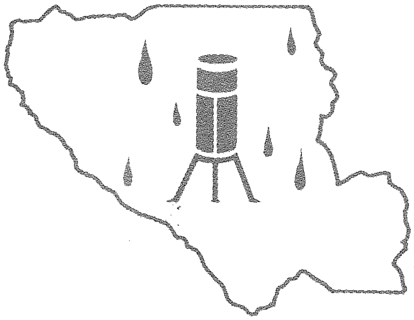

SANTA CLARA COUNTY
FLOOD CONTROL AND WATER DISTRICT

1964 REVISION

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FLOOD CONTROL AND WATER DISTRICT

1964 REVISION

Santa Clara County Board of Supervisors

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TABLE OF CONTENTS

Section			Page
1.0	INTRODUCTION		1
2.0	MEAN ANNUAL PRECIPITATION		3
	2.1	Estimates in Areas of Limited Data	3
	2.2	Isohyetal Map Verification	4
3.0	MEAN ANNUAL RUNOFF		6
	3.1	Annual Records	6
	3.2	Precipitation-Runoff Correlations	6
	3.3	Special Considerations for Valley Floor and Lower Foothills	7
4.0	LONG-TERM PRECIPITATION		8
	4.1	Annual and Monthly Records	8
	4.2	Station Probability Charts	8
	4.3	Regional Means	9
5.0	RAINFALL INTENSITY-DURATION-FREQUENCY		10
	5.1	Annual Analyses for Recording Stations	10
	5.2	Monthly Analyses for San Jose, 782100	11
6.0	FLOOD FREQUENCY		12
	6.1	Peak Streamflow Frequency Curves	12
	6.2	Regional Flood Frequency Relations	12
	6.3	Estimates for Ungaged Watersheds	13
7.0	LONG PRECIPITATION RECORDS		13
	LIST OF TABLES		Green Section
	LIST OF FIGURES		Yellow Section

1.0 INTRODUCTION

Many hydrologic data collecting stations operate in Santa Clara County. Some stations have been in operation 85 years and a vast amount of data have been accumulated. By now the number of items of data totals many millions. Some of the data are published by the United States Weather Bureau, the United States Geological Survey, and the California Department of Water Resources. Most of the unpublished data have been collected and are now on file in the offices of the Santa Clara County Flood Control and Water District.

A person interested in a single observation, i. e., the precipitation for a given place and date, need only locate the data in the proper source and abstract the number. Engineers concerned with the design of a project at a given site where there is a record may obtain a copy of the entire record and abstract the data required for their analysis. When these needs are satisfied by the availability of specific data, there remains in the total accumulated data much information of general interest to County residents and to persons responsible for broad-scale decisions concerning development within the County. Many potential needs will not be completely satisfied by available data because a specific project is located at a site where no data have been collected. No matter how much data are collected, it is a practical impossibility to have data for every point of potential interest within the County.

This "Hydrologic Atlas" for Santa Clara County represents a partial analysis of accumulated data. These data are organized into charts, tables, and maps which present the overall picture for the County in a form which can be readily utilized. The Atlas is intended to provide information which may be of interest to any citizen of the County by giving a general picture of rainfall distribution and runoff. It should be helpful to County administrators considering preliminary plans for a proposed development. It will also be of assistance to engineers in various County offices for verifying plans and proposals submitted to them for review, and it should prove helpful to design engineers by presenting hydrologic information in a form which can be readily used without an extensive analysis of the raw data. Included in the Atlas is material intended to provide a basis for estimating hydrologic characteristics at points where no recorded data are available.

In the third phase of the Hydrologic Data Program for Santa Clara County, a digital-computer technique, the Stanford Watershed Model, has been used to generate streamflow data for a number of watersheds for which recorded data are not available. The data so derived are published in full in a separate document.[1] These data have been used to supplement and expand the information contained in this 1964 revision to the Atlas. Flood frequency curves have been revised to include these data.

Although the Atlas will be of assistance to many people, it should not be considered a device to solve all hydrologic problems within the County. Neither time nor funds permit the inclusion of all possible data analyses. As conditions permit, it is hoped that the preparation of data will continue and that in time the Atlas will become an even more extensive reference source. However, it is impracticable and perhaps undesirable to include all data analyses that might be of use. Information which is needed by only a few persons can often best be developed by those persons at the time it is needed rather than be prepared at County expense to be available if and when needed.

Certain types of analyses may become outdated relatively soon. For example, a flood frequency analysis for a stream with a short record can be substantially altered by the occurrence of just one major flood. For this reason, analyses included in the Atlas are generally limited to those stations with long records, for which the results are likely to remain valid for a substantial period of time. Even with this precaution some of the information will eventually need updating, and users are cautioned to check this possibility.

Some information in the Atlas is estimated. These estimates were required because of limited available data. For example, information on rainfall in the eastern portion of the County is still quite sparse, and the map of mean annual rainfall for this area may contain errors. Thus, as new sources of data are available, revisions to information in the Atlas may be justified.

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[1] Synthesized streamflow data, Santa Clara County, California, Santa Clara County Flood Control and Water District, 1964.

2.0 MEAN ANNUAL PRECIPITATION

A map of mean annual precipitation provides useful information on the general hydrologic character of an area. Although several agencies have prepared such maps for the State of California, no detailed maps for Santa Clara County have been available. From the double-mass curve evaluation of all precipitation stations in the County, generally accurate estimates of normal annual precipitation at these stations were readily available.[2]

All precipitation records within the County were tested by the double-mass curve method including the many short records from stations which are no longer in operation. By comparing these station records with a carefully selected base, an estimate of the probable normal rainfall for the 30-year period, 1931-1960, was derived. Records which covered longer periods were adjusted for inconsistencies, and 30-year normals were computed. The station normal values thus derived were entered on a County map and lines of equal normal rainfall, isohyets, were drawn.

2.1 Estimates in Areas of Limited Data

Despite the large number of stations, some parts of the County were too sparsely covered to permit accurate drawing of isohyetal lines on the basis of station normals alone. A method proposed by Peck and Brown[3] was used with some modifications to obtain estimates of normal annual rainfall in the absence of observed data. Santa Clara County was divided into two zones, the Diablo Mountain Range to the east, and the eastern slope of the Santa Cruz Mountain Range along the western boundary of the County. For each zone a precipitation-elevation relationship was obtained by plotting mean annual precipitation versus elevation for each station and fitting a mean curve. Refer to Figures 2-1 and 2-2.

[2] Evaluation report, hydrologic data reliability, network adequacy, Santa Clara County, Santa Clara County Flood Control and Water Conservation District, 1963.

[3] Peck, Eugene L., and Brown, Merle J., An approach to the development of isohyetal maps for mountainous areas. Journal of Geophysical Research, February, 1962.

A grid overlay of the County was prepared for control, and precipitation station locations were plotted. Using the precipitation-elevation relationships, anomalies were computed for each precipitation station. These anomalies were plotted on a map of the County, and lines of equal values, called isoanomalies, were drawn. For this analysis the anomaly was defined as the quantity required to adjust the value taken from the fitted curve to the observed mean annual precipitation for a given station. Anomalies represent the effect of geography, other than elevation, on precipitation.

Since the County was divided into two zones, isoanomalies were developed for each. The area comprising the Santa Clara Valley floor between the two zones has little change in topography, and data stations were of sufficient density so that isohyets could be drawn without the use of anomalies.

Large variations in normal precipitation caused by topography were taken into account by this method, as elevations in the County range from sea level to 4200 feet, yet the general precipitation-elevation relationships for small geographic areas within the County were retained. Generally, small zones had departure values of the same magnitude and sign on the isoanomaly map. The isoanomalies delineated areas that are sheltered by geographic barriers, or where excess precipitation from orographic lifting and spillover effects occurs.

Stations in small geographic zones that did not appear consistent with surrounding stations were checked against the double-mass curve reliability criteria. The combined use of double-mass reliability criteria, length of station record, and inconsistent departures from the precipitation-elevation curve, verified indications of questionable station records. Such evaluations resulted in deletion of some stations from the isohyetal map. In areas of sparse data, an elevation was determined for a selected point, the corresponding value of rainfall was read from the precipitation-elevation curve, and the value of the isoanomaly passing through the point was added algebraically to give an estimated normal annual precipitation.

2.2 Isohyetal Map Verification

A verification of the isohyetal map was accomplished by comparison with streamflow data. Estimates of normal annual streamflow were prepared. (Refer to

Section 3.0) Mean annual watershed precipitation in inches was planimetered from the preliminary isohyetal map. A graphical correlation of mean annual runoff versus mean annual precipitation was plotted and a curve fitted to the data as shown on Figure 3-1. Plotted points that did not fit the mean curve were investigated for other factors affecting the precipitation-runoff relation. It became apparent that precipitation-runoff characteristics for the mountain ranges on the east and west sides of Santa Clara County were not the same. Separate curves were drawn for watersheds in the Diablo Mountain Range and for watersheds on the eastern slope of the Santa Cruz Mountain Range. A larger amount of runoff is observed for a given quantity of precipitation in the Diablo Mountain Range, probably resulting from the lesser amounts of vegetation and consequently reduced evapotranspiration losses.

Those watersheds which did not conform to the curve for their region were mostly basins in which the precipitation data are limited. The preliminary isohyets for these areas were adjusted where feasible to bring the point closer to the mean precipitation-runoff relation. The adjustments were generally small since the isohyets had to conform to recorded station normal values.

With this adjustment the isohyetal map was considered complete and as reliable as possible with currently available data. Caution should be exercised when using information from areas of the map where a lack of circled precipitation figures indicates a scarcity of data. The final map appears as Figure 2-3.

3.0 MEAN ANNUAL RUNOFF

In evaluating the reliability of the streamflow stations within the County[2], relations between annual precipitation at a station within or near each watershed and annual runoff were developed. Streamflow data were adjusted for storage and diversion so as to yield approximately full natural flow. Since most stations had less than thirty years of record, a complete record of annual flow for each station for the water years 1931-1960 was developed by use of correlations. Adjusted annual precipitation at the selected precipitation station was used to enter the station rainfall-runoff curve and estimate the streamflow during the missing years.

3.1 Annual Records

During Phase III of the study, records of streamflow were extended for several stations by use of the Stanford Watershed Model. Tables 3-1 to 3-7 summarize observed, estimated, and synthesized streamflow data for 20 stations.

3.2 Precipitation-Runoff Correlations

Relations between mean annual runoff and mean annual precipitation for all basins having reliable records were plotted as shown on Figure 3-1. Data resulting from streamflow synthesis in Phase III were used to check the original precipitation-runoff correlations. Precipitation-runoff characteristics for the Santa Clara Valley floor based on the effects of urban development projected for the year 1985 have been added.

Assuming that these relations indicate the variation of runoff with rainfall for any point, a map of mean annual runoff, Figure 3-2, was constructed based on the map of mean annual precipitation, Figure 2-3. Probable mean annual runoff for any small watershed within the County can be estimated directly from Figure 3-2. Runoff for large watersheds can be obtained by planimetry. Values of runoff obtained from the map for local areas where streamflow data are lacking should be used with caution.

3.3 Special Considerations for Valley Floor and Lower Foothills

Contours of runoff for the valley floor and for some of the lower foothills are not shown on the map. Conditions on the valley floor are highly variable depending on land use and the degree of development. No records of flow were available to use as a basis for estimating annual runoff prior to the Phase III study, and insufficient synthesized data is available presently to justify the inclusion of contours of runoff for valley floor areas.

In the lower foothills, many streams are influent, i. e., contribute flow to the ground water as channel seepage. Two instances of channel seepage were discovered during the Phase III study. In developing the calibration factors for synthesizing streamflow data, it was determined that the watershed Saratoga Creek at Saratoga, Streamflow Station Index Number 169500, contributed to channel seepage a volume approximately equal to 35 per cent of total measured runoff. Channel seepage was also apparent on Coyote Creek above Coyote Dam, where an amount ranging between 10 and 20 per cent of the volume of surface runoff flows in the extensive gravel deposits below streambed level.

Measured runoffs at valley floor gaging stations do not, therefore, reflect the actual runoff from the watershed but rather the runoff as reduced by channel losses. Since channel seepage is highly variable depending on the nature of the material through which the stream flows, it is not possible to make simple adjustments for these losses. Local storm sewer inflow also contributes to measured runoff in many urban areas, so each instance requires a careful study with appropriate field investigation.

4.0 LONG-TERM PRECIPITATION

Eight long-term precipitation stations have been selected as representative of various areas of the County. Los Gatos and Wrights represent the Santa Cruz Mountain Range; Palo Alto and Gilroy Wentz, the north and south valley areas; and Mt. Hamilton, Calaveras Reservoir and Shanti Ashrama, the Mt. Diablo Range. San Jose was considered to be representative of central Santa Clara Valley.

4.1 Annual and Monthly Records

Annual and monthly records of precipitation at each station were adjusted using double-mass curve analyses.[2] Where possible, composite records were obtained by adjusting older station records to the most recent station location. The resulting annual and monthly data are given in Tables 4-1 through 4-8. The source of the data and the adjustments applied are noted.

4.2 Station Probability Charts

Values of annual precipitation were arranged in order of magnitude and assigned a frequency given by:

$$P = \frac{m}{n + 1}(100) \qquad (1)$$

in which:

P = the percentage of years in which precipitation is equal to or less than the given amount
n = the number of years of record
m = the order of magnitude of any year decreasing from n for the wettest year to 1 for the driest year.

Each annual amount was plotted against its corresponding probability on normal probability paper. The resulting straight lines indicate that the annual amounts conform to the normal probability distribution.

Total precipitation each year beginning on the first of each month from December 1 through May 1 and ending on May 31 was computed for each station and plotted on the probability charts with the annual amounts. These plots appear as Figures 4-1 through 4-8. These charts may be used to estimate the probability of occurrence of any given amount of annual rainfall at each station, and similarly the probability of any given amount of rainfall from the first of any month to the end of the season. For example:

> San Jose (Figure 4-6) will have less than 13 inches for the year in one out of every two years. The chances are equal that rainfall from March 1 to May 31 will be above or below 3.3 inches but only one year in ten will get less than 1.7 inches during this period. After April 1, San Jose will have more than 0.58 inch in four years out of five.

4.3 Regional Means

A comparison of the station probability charts indicates that there are two regional patterns of frequency which differ only slightly. To generalize the data, values of station precipitation were taken from the station curves for selected probability values. The precipitation values were then divided by the station normal values to yield percentages of normal. These figures were averaged for the four stations in each region and curves were plotted showing the percentage of normal rainfall as a function of probability. (Refer to Figure 4-9) Palo Alto, Los Gatos, Wrights and Gilroy Wentz represent the western County, and Mt. Hamilton, San Jose, Calaveras Reservoir, and Shanti Ashrama represent the eastern County.

Estimates of the probability of a given annual amount of precipitation at any point within the County can be obtained by determining the percentage of normal annual precipitation which the given amount represents based on Figure 2-3, or from the Hydrologic Data Index[4], and applying the appropriate curve from Figure 4-9. For a valley point, a value lying between the eastern and western probabilities can be used.

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[4] Hydrologic data index, Santa Clara County, California, Santa Clara County Flood Control and Water Conservation District, 1963 Revision.

5.0 RAINFALL INTENSITY-DURATION-FREQUENCY

Design of local drainage works is generally accomplished by estimating peak flow rates on the basis of expected rainfall intensities. Relations showing the probability of various rainfall intensities for various durations of rain are basic to such work.

5.1 Annual Analyses for Recording Stations

Annual maximum rainfalls for durations of 1, 2, 6, and 24 hours were tabulated for each year of record at nine recording rainfall stations. At Palo Alto it was possible to obtain figures for 15 and 30 minutes from the recorder charts which are on file at City Hall, and for San Jose these figures had been abstracted and published in monthly bulletins. Clock-hour values were multiplied by adjustment factors as determined by the United States Weather Bureau.

Assembled data for each duration at each station were subjected to an extreme value analysis using the technique suggested by Gumbel. Intensities having return periods of 2, 5, 10, 20, 50, and 100 years were determined. These values were plotted on logarithmic scales and the complete intensity-duration-frequency family was constructed. Each of the station plots approximated a family of straight lines conforming to the general equation:

$$i = \frac{K}{t^n} \tag{2}$$

in which:

i = the rainfall intensity, in inches per hour
t = the duration, in hours
n = a constant for each station, varying between 0.33 and 0.55
K = a regional constant, being a function of mean annual precipitation and frequency.

The resulting curves for individual precipitation stations are shown on Figures 5-1 through 5-9. A regional plot relating values of "K" and "n" to mean annual precipitation is shown as Figure 5-10. With these regional constants a set of intensity-duration-frequency curves may be constructed for any point within the County by determining the appropriate value of mean annual precipitation from the map, Figure 2-3.

5.2 Monthly Analyses for San Jose, 782100

The data for San Jose were conveniently available in a form from which a set of intensity-duration-frequency curves could be prepared for each month of the year having significant rainfall. These curves for the months September through June are shown on Figures 5-11 through 5-20. The curves are shown for both computed and estimated values where computed values diverged from the mean trend. The curves for estimated values are based on values to be expected if sufficient long-term data were available for the analysis. The curves show a marked variation in intensities to be expected for different months and suggest that for particular problems it may be appropriate to consider conditions other than the annual maxima. For example, a temporary culvert for a construction job might be sized for the specific months during which it will be in use.

Although monthly analyses were not made for other stations within Santa Clara County, in view of the high degree of similarity between the various County stations, it seems reasonable to expect that the monthly variation at other stations might be very similar to that at San Jose.

6.0 FLOOD FREQUENCY

6.1 Peak Streamflow Frequency Curves

Figures 6-1 to 6-26 present flood frequency curves for the longer return periods. These were derived by the Gumbel-type extreme value analysis, and by the Hazen log-normal method. The curves were computed for those stations having a sufficient length of observed or synthesized record and satisfactory peak flow data. The Hazen method generally gives more conservative (higher) peak flow events for longer return periods. In applying the log-normal method, the skew coefficient is subject to arbitrary variation. For this application, coefficients were calculated by a standard procedure based on the third moment of the data. In a few instances, the curve based on this skew coefficient varied significantly from the extreme value curve. It is felt that the effects of urbanization are largely responsible for this distortion. Rather than choose a coefficient arbitrarily in order that the log-normal curve more nearly coincide with that for the extreme value analysis, the log-normal curve was omitted from Figures 6-22 and 6-25. The extreme value analysis gives the more reasonable answers for these cases. For frequency estimates for very short return periods (less than ten years) it is suggested that a curve be sketched through the plotted points.

In several instances these curves are based on relatively short records and should be used with appropriate caution. Synthesized data developed during Phase III studies were used to compute frequency curves for a number of ungaged streams and curves for six of these streams are included. The peak flow frequency curve for Wildcat Creek, Figure 6-14 in the original Atlas, has been replaced by Figure 6-26. Those curves based primarily on synthesized data represent conditions for urban development as projected to 1985.

6.2 Regional Flood Frequency Relations

If the normal annual flood is defined and the slope of the frequency curve is fixed, the entire flood frequency curve for a basin can be obtained. Each frequency curve analyzed indicated a somewhat different slope. For the original Atlas, the basins were divided into two regional groups, the Diablo Mountain Range and the east slope of the Santa Cruz Mountain Range. In this revised edition, a re-evaluation using the synthesized streamflow data was made. Mean frequency curve slope for the two groups were discovered to be very nearly equal when the curves for the streams with synthesized streamflow data were included and the two curves have been combined.

The mean curve is shown in Figure 6-27 with flow expressed in percentage of the mean annual peak flood, i. e., 2.33 year return period. In view of the very limited data available for this analysis, the correlation should be considered tentative and should be checked by other methods whenever possible.

6.3 Estimates for Unagaged Watersheds

Although the amount of flood data within the County is extremely limited, an attempt was made to develop a generalized procedure by which flood frequencies could be estimated for ungaged watersheds larger than one square mile in area. A regional flood frequency analysis of the type used by the United States Geological Survey was employed. This analysis consisted of correlating the mean annual flood, defined as the flow indicated at a return period of 2.33 years on the station frequency plots, with the physical parameters of the watershed. The most effective correlation consisted of relating mean peak flow in cubic feet per second per square mile with mean annual precipitation, per cent of the watershed in forest cover and a shape factor, $\frac{A}{L^2}$, in which A = the watershed area, in square miles, and L = the length of the basin, in miles measured along the stream channel. The results are shown on Figure 6-28. By multiplying the mean annual flood from Figure 6-28 by the flood frequency relation from Figure 6-27 the flood frequency curve for the ungaged basin may be derived.

Peak flow data derived during Phase III were generally consistent with values obtained from the curves. With only 12 useful stations available for correlation, and four stations available for verification, neither revisions nor a more complicated flood frequency relation were considered to be justified. Caution should be used when applying the relation, particularly in areas of urban development.

7.0 LONG PRECIPITATION RECORDS

A number of very long precipitation records are available within or near the County. Tables 7-1 and 7-2 list annual precipitation at these stations with all values adjusted to the present location of the station. A few composite stations have been included. These are combinations of records at stations located reasonably close together. The records are adjusted to a single location by the double-mass curve method. Additional long-term precipitation records can also be found in the Evaluation Report.[2]

LIST OF TABLES

Table			
	ANNUAL RUNOFF IN ACRE-FEET		
3-1	Pacheco Creek	153000	1923 - 1961
	Uvas Creek	154000	1923 - 1959
	Los Trancos Creek	163500	1930 - 1959
3-2	San Francisquito Creek	164500	1930 - 1961
	Permanente Creek	166580	1930 - 1959
	Hale (Magdalena) Creek	166610	1930 - 1959
3-3	Permanente Creek	166630	1930 - 1959
	Alamitos Creek	166680	1930 - 1959
	Alamitos Creek	167000	1930 - 1959
3-4	Guadalupe Creek	167400	1930 - 1959
	Guadalupe Creek	167500	1930 - 1959
	Golf (McAbee) Creek	167530	1930 - 1959
3-5	Ross Creek	167640	1930 - 1959
	Los Gatos Creek	168000	1930 - 1961
	Wildcat Creek	169200	1930 - 1959
3-6	San Tomas Aquino Creek	169400	1930 - 1959
	Saratoga Creek	169500	1923 - 1961
	Coyote Creek	170000	1930 - 1961
3-7	Penitencia Creek	172120	1923 - 1961
	Penitencia Creek	172170	1930 - 1959
	MONTHLY AND ANNUAL PRECIPITATION		
4-1	Calaveras Reservoir	128100	1874 - 1960
4-2	Gilroy Wentz Composite	--	1894 - 1957
4-3	Los Gatos Composite	--	1885 - 1962
4-4	Mount Hamilton	593300	1881 - 1962
4-5	Palo Alto Composite	--	1906 - 1962
4-6	San Jose	782100	1874 - 1962
4-7	Wrights Composite	--	1899 - 1962
4-8	Shanti Ashrama	813000	1912 - 1951
	LONG-TERM ANNUAL PRECIPITATION IN INCHES		
7-1	Gerber Ranch	338700	1910 - 1960
	Crystal Springs Cottage	220500	1894 - 1959
	Paradise Valley	668901	1897 - 1960
	Santa Clara University	791200	1881 - 1961
7-2	Alma College	012100	1914 - 1960
	Arroyo Mocho	031901	1917 - 1960
	Bear Gulch Reservoir	056400	1919 - 1960
	Big Basin Way	074000	1915 - 1959
	Hayward High School	386400	1914 - 1960
	Lake Kittredge	468600	1915 - 1959
	Los Gatos Reservoir	512455	1915 - 1959
	Main Station	526800	1914 - 1958
	Montevina Road Reservoir	580300	1915 - 1959
	Seven Mile Reservoir	810700	1915 - 1959

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TABLE 3-1

ANNUAL RUNOFF IN ACRE-FEET

WATER YEAR	STREAMFLOW GAGING STATION AND INDEX NUMBER					
	Pacheco Creek 153000		Uvas Creek 154000		Los Trancos Creek 163500	
	Observed	Synthesized	Observed	Synthesized	Observed	Synthesized
1923-24		171		932		
1924-25		2160		6790		
1925-26		1230		27600		
1926-27		16200		24300		
1927-28		15200		14200		
1928-29		7450		7080		
1929-30		6960		29800		
1930-31		1290	1970		90	
1931-32		61500	32700		2352	
1932-33		6600	5580		639	
1933-34		863	10100		467	
1934-35		29200	15520		1567	
1935-36		28000	25300		1716	
1936-37		29200	31440		3257	
1937-38		59600	68030		5731	
1938-39		1810	4600		410	
1939-40	37370		44480		5380	
1940-41	84970		57500		6431	
1941-42	29540		38800			2660
1942-43	41800		27800			2650
1943-44	19800		17280			1010
1944-45	24680		24950			2130
1945-46	7300		15190			995
1946-47	5260		9950			930
1947-48	0		6020			213
1948-49	2890		13840			960
1949-50	5060		10800			1200
1950-51	42600		39900			4200
1951-52	63310		54900			6570
1952-53	10840		19900			4330
1953-54	200		13700			497
1954-55	2940		9700			846
1955-56	68240		56600			5970
1956-57	2170			8000*		460
1957-58	76430			58000*		5730
1958-59	18340			4200*		687
1959-60	8540			11300*		700
1960-61	0					
1961-62	12600					

* estimated data

May 1964

TABLE 3-2

ANNUAL RUNOFF IN ACRE-FEET

WATER YEAR	STREAMFLOW GAGING STATION AND INDEX NUMBER					
	San Francisquito Creek 164500		Permanente Creek 166580		Hale (Magdalena) Creek 166610	
	Observed	Estimated	Observed	Estimated	Observed	Estimated
1923-24						
1924-25						
1925-26						
1926-27						
1927-28						
1928-29						
1929-30						
1930-31	1033			240		80
1931-32	14015			2400		480
1932-33	3215			270		80
1933-34	2519			190		60
1934-35	11620			3150		700
1935-36	13490			2000		350
1936-37	23613			3450		830
1937-38	38546			5400		1420
1938-39	2831			330	0	
1939-40	29665			3900	1120	
1940-41	36803		8800		1980	
1941-42		17400	5160		1000	
1942-43		17300	3120		431	
1943-44		6630	520		63	
1944-45		14000	1720		119	
1945-46		6520	1040		140	
1946-47		6100	280		0	
1947-48		1400	70		0	
1948-49		6300	600		120	
1949-50		7860	310		50	
1950-51	31337		2600		300	
1951-52	44691		4350		1170	
1952-53	15331		2030		400	
1953-54	5346		500		120	
1954-55	5778		190		150	
1955-56	38307		5000		1490	
1956-57	4592		370		150	
1957-58	46531		6280		1830	
1958-59	5233		170		160	
1959-60	5392		380		260	
1960-61	45					
1961-62	4630					

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INCORPORATED

May 1964

TABLE 3-3

ANNUAL RUNOFF IN ACRE-FEET

WATER YEAR	STREAMFLOW GAGING STATION AND INDEX NUMBER: Permanente Creek 166630		Alamitos Creek 166680		Alamitos Creek 167000	
	Observed	Estimated	Observed	Estimated	Observed	Estimated
1923-24						
1924-25						
1925-26						
1926-27						
1927-28						
1928-29						
1929-30						
1930-31		100		6300	0	
1931-32		1600		12000	17900	
1932-33		120		6500	1050	
1933-34		50		5800	7220	
1934-35		2900		14000	10370	
1935-36		1300		11200	9870	
1936-37		1400		12500	16910	
1937-38		7000		21600	48950	
1938-39		200	2560		350	
1939-40	3910		18930		23380	
1940-41	9040		24040		37480	
1941-42	4880		15230		21600	
1942-43	3270		11860		16970	
1943-44	590		8220		6730	
1944-45	1540		10350		11440	
1945-46	490		9300		7330	
1946-47	40		4690		1390	
1947-48	0		7830		2280	
1948-49	330		9950		7720	
1949-50	60		5430		2900	
1950-51	1940		14890		13560	
1951-52	4730		20720		34550	
1952-53	1480		8380		8440	
1953-54	120		8280		5510	
1954-55	170		7280		4700	
1955-56	8330		26510		30570	
1956-57	380		14280		4380	
1957-58	10830		24440			32900
1958-59	180		6500			9520
1959-60	260		4050			3310
1960-61						
1961-62						

May 1964

TABLE 3-4

ANNUAL RUNOFF IN ACRE-FEET

WATER YEAR	STREAMFLOW GAGING STATION AND INDEX NUMBER					
	Guadalupe Creek 167400		Guadalupe Creek 167500		Golf (McAbee) Creek 167530	
	Observed	Estimated	Observed	Estimated	Observed	Estimated
1923-24						
1924-25						
1925-26						
1926-27						
1927-28						
1928-29						
1929-30						
1930-31		2300	720			120
1931-32		5400	8800			570
1932-33		2400	1960			120
1933-34		2050	5240			100
1934-35		6100	7110			720
1935-36		5000	6510			500
1936-37		6500	9830			780
1937-38		8500	22520			1230
1938-39		2600	1830		100	
1939-40		6900	12640		880	
1940-41		9400	16320		2160	
1941-42	7780		13800		1220	
1942-43	5390		8240		440	
1943-44	3680		5250		270	
1944-45		4450	7290		270	
1945-46	3300		5260		260	
1946-47	1100		2100		120	
1947-48	1600		3110		100	
1948-49	4020		5660		380	
1949-50	1570		2610		140	
1950-51	9930		8950		420	
1951-52	12060		18240		1240	
1952-53	5140		5650		730	
1953-54	3340		4920		270	
1954-55	2450		4750		100	
1955-56	10090		17330		1710	
1956-57	4320		4020		120	
1957-58	8570		20340		1550	
1958-59	4260		6060		410	
1959-60	2060		2800		10	
1960-61						
1961-62						

May 1964

TABLE 3-5

ANNUAL RUNOFF IN ACRE-FEET

WATER YEAR	STREAMFLOW GAGING STATION AND INDEX NUMBER					
	Ross Creek 167640		Los Gatos Creek 168000		Wildcat Creek 169200	
	Observed	Estimated	Observed	Estimated	Observed	Estimated
1923-24						
1924-25						
1925-26						
1926-27						
1927-28						
1928-29						
1929-30						
1930-31		40	2900			70
1931-32		670	31400			1250
1932-33		70	7250			310
1933-34		370	18020			900
1934-35		630	29250			1380
1935-36		230	28560			680
1936-37		460	37020			2120
1937-38		2150	82190			3750
1938-39	120		6210			80
1939-40	700		59650			1980
1940-41	2500		81430			3970
1941-42	1730		53890			2650
1942-43	276		36310			1310
1943-44	282		18950			400
1944-45	635			29500		880
1945-46	350			29500	570	
1946-47	20			11800	40	
1947-48	20			19000	40	
1948-49	420			23500	600	
1949-50	170			15000	1840	
1950-51	1000			45800	1180	
1951-52	1900			74000	3060	
1952-53	460			25000	640	
1953-54	210		23570		280	
1954-55	250		19390		280	
1955-56	2220		68110		4100	
1956-57	210		17710		630	
1957-58	1830		72040		3990	
1958-59	470		22930		540	
1959-60	130		11190		220	
1960-61			5610			
1961-62			29370			

May 1964

TABLE 3-6

ANNUAL RUNOFF IN ACRE-FEET

WATER YEAR	STREAMFLOW GAGING STATION AND INDEX NUMBER					
	San Tomas Aquino Creek 169400		Saratoga Creek 169500		Coyote Creek 170000	
	Observed	Estimated	Observed	Synthesized	Observed	Estimated
1923-24				475		
1924-25				2990		
1925-26				7670		
1926-27				5220		
1927-28				3010		
1928-29				2090		
1929-30				2980		
1930-31		0		1430	1970	
1931-32		700		4180	73100	
1932-33		0		2020	8410	
1933-34		0	3720		11000	
1934-35		1200	5010		32320	
1935-36		140	5210		54610	
1936-37		2330	7500		73100	
1937-38		3320	15840		153720	
1938-39		0	1470		10950	
1939-40		1500	13240		75220	
1940-41		5480	18440		144930	
1941-42		2200	12100		74850	
1942-43		730	7040		66590	
1943-44		0	3060		48110	
1944-45		130	4930		52330	
1945-46	240		5210		29560	
1946-47	0		1810		9350	
1947-48	10		1970		5190	
1948-49	140		4190		18620	
1949-50	0		1990		13530	
1950-51	90		7910		60830	
1951-52	3520		13870		109540	
1952-53	0		6290		16220	
1953-54	140		4000		0	
1954-55	0		3190		4370	
1955-56	1520		15480		92790	
1956-57	0		2850		2760	
1957-58	4830		17560		126420	
1958-59	0		3820		34980	
1959-60	210		1780		6000	
1960-61			2055		20190	
1961-62			5524		30310	

May 1964

TABLE 3-7

ANNUAL RUNOFF IN ACRE-FEET

WATER YEAR	STREAMFLOW GAGING STATION AND INDEX NUMBER			
	Penitencia Creek 172120		Penitencia Creek 172170	
	Observed	Synthesized	Observed	Estimated
1923-24		82		
1924-25		430		
1925-26		4760		
1926-27		2830		
1927-28		898		
1928-29		698		
1929-30		1850		
1930-31		373		700
1931-32		2960		2800
1932-33		1110		800
1933-34		452		600
1934-35		5050		4400
1935-36		2020		1100
1936-37		8680		4800
1937-38		8390		9000
1938-39	1390		180	
1939-40	6490		4080	
1940-41	11020		7800	
1941-42	8030		5400	
1942-43	5650		3350	
1943-44	5500		3420	
1944-45	6200		3900	
1945-46	2730		1140	
1946-47	110		0	
1947-48	180		20	
1948-49	1380		630	
1949-50	1250		560	
1950-51	6840		5360	
1951-52	14030		12020	
1952-53	1380		1050	
1953-54	560		120	
1954-55	850		590	
1955-56	10190		8570	
1956-57	570		460	
1957-58	12570		12090	
1958-59	930		540	
1959-60	880		700	
1960-61	234			
1961-62	1730			

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INCORPORATED

May 1964

TABLE 4-1

MONTHLY AND ANNUAL PRECIPITATION IN INCHES **
Calaveras Reservoir 128100

YEAR	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	ANNUAL TOTAL
1874-75	0	0	0	3.33	3.71	0.15	4.62	0.48	0.93	0	0	0	13.22
1875-76	0	0	0	0.28	8.97	3.91	5.54	5.52	6.95	1.43	0.29	0	32.89
1876-77	0	0	0	2.30	0.12	0	5.28	0.54	1.12	0.51	0	0	9.87
1877-78	0	0	0	0.23	1.00	1.94	8.32	12.08	0	0	0	0	23.57
1878-79	0	0	0.20	0.58	0.30	0.35	3.80	2.47	4.70	2.87	2.01	0.12	17.40
1879-80	0	0	0	1.10	2.43	4.33	2.77	2.44	1.87	6.68	0.86	0	22.48
1880-81	0	0	0	0.03	0.56	8.64	3.74	3.98	1.80	1.10	0.04	0.44	20.33
1881-82	0	0	0.17	0.35	1.49	2.92	1.90	2.36	5.72	2.83	0.37	0.01	18.12
1882-83	0	0	0.37	1.53	1.78	2.28	0.95	1.58	3.52	2.57	2.80	0	17.38
1883-84	0	0	0.27	1.40	0.68	0.92	4.47	7.97	7.55	5.58	0.32	1.10	30.26
1884-85	0	0.08	0.20	1.46	0.02	9.73	2.36	0.24	0.38	1.19	0.04	0.24	15.94
1885-86	0	0	0.08	0	8.89	2.24	6.59	1.11	1.64	5.16	0	0	25.71
1886-87													*16.44
1887-88													*19.22
1888-89	0	0	0.41	0	3.39	2.70	0.52	0.87	5.38	0.86	2.01	0	16.14
1889-90	0	0	0	4.56	3.24	10.46	8.14	4.65	2.81	1.71	1.41	0	36.98
1890-91	0	0	0.61	0	0.08	3.99	0.73	5.07	2.67	2.35	0.73	0.20	16.43
1891-92	0	0	0.41	0.24	0.61	8.36	0.80	1.78	4.07	1.47	2.60	0.16	20.50
1892-93	0	0	0	1.42	6.81	5.75	4.64	3.13	6.78	2.56	0.74	0	31.83
1893-94	0	0	0.12	0.24	2.21	2.92	6.59	7.83	2.14	0.85	1.66	0.46	25.02
1894-95	0	0	1.49	2.66	0.81	9.76	7.41	3.26	2.44	2.23	1.31	0	31.37
1895-96	0	0	0.25	0.71	1.92	2.16	6.83	0.42	1.98	5.30	1.40	0	20.97
1896-97	0	0.45	0.24	1.64	4.04	3.63	2.14	6.18	6.07	0.73	0	0.22	25.34
1897-98	0	0	0	1.23	0.90	1.99	1.33	2.69	0.74	0.41	1.35	0.22	10.86
1898-99	0	0	0.50	1.07	0.88	1.75	3.68	0	7.98	1.04	0.95	0	17.85
1899-00	0	0	0	4.61	4.09	2.84	2.72	1.18	2.30	2.27	0.97	0	20.98
1900-01	0	0	0	3.38	5.77	1.75	3.40	5.43	1.53	2.24	1.40	0	24.90
1901-02	0	0	0.65	1.42	1.63	1.36	1.28	5.88	4.26	1.58	0.84	0	18.90
1902-03	0	0	0	1.46	3.45	1.45	4.99	1.70	6.17	0.70	0.34	0	20.26
1903-04	0	0	0	0.15	4.21	1.06	1.40	6.45	5.60	3.25	0.20	0	22.32
1904-05	0	0.62	3.27	2.41	1.73	3.23	3.20	3.78	5.68	1.47	3.33	0	28.72
1905-06	0	0	0	0	2.88	1.95	8.64	3.90	6.77	1.52	1.61	0.77	28.04
1906-07	0	0	0.33	0	1.16	8.60	5.84	2.13	14.41	0.24	0.01	0.26	32.98
1907-08	0	0	0	0.86	0.12	6.40	3.10	3.54	1.13	0.26	1.93	0	17.34
1908-09													*26.20
1909-10													*20.09
1910-11	0	0	0	0.50	0.38	0.96	14.94	3.71	6.01	0.96	0.62	0.04	28.12
1911-12	0	0	0.01	1.26	1.01	3.03	2.41	0.39	3.12	2.02	0.82	0.72	14.79
1912-13													*12.08
1913-14													*25.70
1914-15													35.15
1915-16													22.15
1916-17													15.98
1917-18													11.54
1918-19													24.28
1919-20													15.64

* Synthesized Data ** Double-Mass Adjusted

May 1964

TABLE 4-1
(Continued)

MONTHLY AND ANNUAL PRECIPITATION IN INCHES **
Calaveras Reservoir 128100

YEAR	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	ANNUAL TOTAL
1920-21	0	0	0.01	2.16	2.85	6.78	6.09	3.28	1.71	0.49	1.75	0	25.12
1921-22	0	0	0.16	0.21	1.79	5.18	2.59	5.99	3.44	0.93	0.92	0.12	21.33
1922-23	0	0	0	1.03	3.38	7.13	3.22	0.87	0.29	2.48	0.02	0.17	18.59
1923-24	0	0.02	1.08	0.43	0.37	1.41	1.78	1.25	1.67	0.49	0.12	0	8.62
1924-25	0	0	0.02	2.21	1.75	4.63	1.45	6.49	2.69	2.15	1.73	0	23.12
1925-26	0	0	0.03	0.33	2.18	2.05	4.22	6.05	0.14	4.14	0.40	0	19.54
1926-27	0	0.01	0	0.77	4.84	1.88	3.14	5.48	2.41	1.44	0.56	0.23	20.76
1927-28	0	0	0.03	1.93	2.09	4.95	2.52	2.07	6.63	1.50	0.33	0	22.05
1928-29	0	0	0	0.02	3.66	4.06	2.24	0.96	2.50	2.19	0.16	1.47	17.26
1929-30	0	0	0	0	0	2.46	5.51	3.41	3.62	1.68	0.81	0	17.49
1930-31	0	0	0.18	0.77	1.91	0.16	4.76	2.66	0.83	0.66	1.60	0.24	13.77
1931-32	0	0	0.02	0.78	3.39	8.26	2.82	3.90	0.57	0.52	0.66	0	20.92
1932-33	0.02	0	0	0	0.49	3.36	6.24	1.08	2.56	0.72	1.37	0.02	15.86
1933-34	0	0	0.11	1.20	0	5.11	0.78	3.74	0.15	0.55	1.09	0.78	13.51
1934-35	0	0	0.47	1.01	3.92	3.42	5.98	1.28	3.85	5.06	0.01	0.03	25.03
1935-36	0	0.21	0.13	1.09	0.72	2.16	6.34	8.56	1.12	1.53	1.16	0.30	23.32
1936-37	0.03	0	0	0.66	0.02	4.88	4.41	5.91	7.02	1.45	0.03	0.23	24.64
1937-38	0	0	0	0.60	2.12	5.13	5.63	8.76	4.91	1.45	0.01	0	28.61
1938-39	0	0	0.16	1.49	1.93	1.04	4.24	3.57	2.95	0.68	0.80	0	16.86
1939-40	0	0	0.56	0.96	0.48	0.98	10.56	7.42	4.93	0.79	0.34	0	27.02
1940-41	0	0	0.28	1.02	1.26	5.32	4.54	5.77	3.08	4.01	0.71	0	25.99
1941-42	0	0	0.07	1.06	1.15	6.27	5.32	2.97	1.93	4.38	1.92	0.12	25.19
1942-43	0	0	0.12	1.15	5.49	2.71	4.44	2.36	3.68	2.18	0.12	0.12	22.37
1943-44	0	0	0	0.91	1.22	1.79	3.59	7.39	0.99	2.09	0.86	0.21	19.05
1944-45	0	0	0	2.14	4.62	2.73	1.84	2.83	4.68	0.31	0.73	0.12	20.00
1945-46	0	0.02	0.03	1.16	2.81	5.29	1.85	2.52	2.40	0.02	1.44	0	17.54
1946-47	0.36	0	0.15	0.03	2.65	2.63	1.14	1.19	3.26	0.62	0.36	0.63	13.02
1947-48	0	0	0	3.64	1.08	0.79	0.43	1.73	4.70	4.46	1.69	0.15	18.67
1948-49	0.02	0	0	0.49	0.56	3.47	1.25	2.67	5.54	0.02	0.48	0	14.50
1949-50	0.04	0.13	0	0.26	1.34	1.40	5.77	0.70	2.91	0.85	0.41	0	13.81
1950-51	0	0	0.08	1.97	8.69	4.93	2.75	2.34	2.30	0.84	0.38	0.14	24.42
1951-52	0	0	0	1.06	4.69	7.82	9.47	2.76	4.81	2.07	0.10	0.07	32.85
1952-53	0	0	0.22	0	3.07	7.75	3.66	0.05	2.87	2.40	0.86	0.27	21.15
1953-54	0	0.22	0.02	0.99	2.58	1.61	3.01	3.21	3.63	1.01	0.10	0.71	17.09
1954-55	0	0.02	0	0.05	2.02	5.22	4.44	2.19	0.25	2.86	0.13	0	17.18
1955-56	0	0	0	0.02	1.95	13.50	7.56	2.39	0.22	1.63	1.23	0.03	28.58
1956-57	0	0	0.60	1.84	0.02	0.82	3.33	3.29	2.22	2.28	2.44	0.10	16.94
1957-58	0	0	0.25	1.42	1.05	3.88	5.38	7.22	7.69	4.27	0.68	0.41	32.25
1958-59	0	0	0.02	0.03	0.79	1.41	3.08	5.63	0.82	0.54	0	0	12.32
1959-60	0	0	3.10	0	0	1.03	4.13	5.07	1.34	1.41	0.51	0	16.71
1960-61	0.11	0	0	0.04	2.96	1.62	2.31	1.32	2.89	1.61	0.89	0.14	13.89

Double-Mass Adjustment Factors

1874-75 to 1903-04	0.8121	1931-32 to 1948-49	1.0630
1904-05 to 1911-12	1.0000	1949-50 to 1950-51	0.8121
1912-13 to 1930-31	1.1351	1951-52 to 1960-61	1.0000

* Synthesized Data ** Double-Mass Adjusted

1899-00	0	T	0	5.55	3.84	3.46	5.40	0.45	2.93	1.73	0.88	T	24.24
1900-01	T	0	0.05	2.39	9.27	2.50	8.96	9.74	1.09	5.59	1.76	T	41.35
1901-02	T	T	0.90	1.10	3.34	0.73	1.28	14.49	7.59	2.63	1.17	0	33.23
1902-03	0	0	0	2.80	4.90	1.89	5.93	2.51	10.17	0.78	0	T	28.98
1903-04	0	0	0	0.84	4.94	0.74	1.20	9.14	8.54	3.66	0.19	T	29.25
1904-05	0	0.57	5.97	2.83	1.15	3.23	4.98	0	6.55	1.21	3.53	0	30.02
1905-06	0	0	T	T	3.00	1.64	13.65	4.75	10.81	1.01	2.98	0.29	38.13
1906-07	0	0	0	T	1.76	11.39	8.36	2.11	18.13	0.42	0.13	0.87	43.17
1907-08	0	T	0.06	1.41	0.03	8.00	3.80	5.85	2.31	0.35	0.57	0	22.38
1908-09	0	0	0.07	0.40	1.73	2.90	23.90	10.83	4.85	0	0	0.07	44.75
1909-10	0	0	1.15	0.63	1.71	8.63	6.94	2.04	4.28	0.36	0	0.04	25.78
1910-11	T	0	0.02	0.60	0.58	1.73	27.66	4.79	14.16	2.46	0.59	0.05	52.64
1911-12	T	0	T	0.55	0.70	2.66	4.15	0.28	5.52	3.66	1.61	0.33	19.46
1912-13	0	0	1.59	0.24	0.70	1.19	6.88	0.24	3.28	0.40	0.95	0.06	15.53
1913-14	0	0.02	0	T	4.95	8.05	18.14	6.76	0.92	0.89	0.28	0.28	40.29
1914-15	0	0	0	0.79	0.50	6.28	7.05	13.59	3.17	1.05	3.29	0	35.72
1915-16	T	T	0	0	1.13	11.62	22.25	3.68	2.52	0	0.05	0	41.25
1916-17	T	T	0.65	1.03	0.51	9.47	1.17	15.33	1.46	0.40	0.18	0	30.20
1917-18	T	0	T	0	0.56	1.96	0.72	5.71	6.23	0.37	0	0	15.55
1918-19	0	0	7.32	0.32	6.37	2.68	2.66	12.85	4.73	0.05	0	0	36.98
1919-20	0	0	0.56	0.24	0.12	7.75	0.59	1.43	7.90	3.20	0	0.21	22.00
1920-21	0	0	0.02	3.04	4.25	7.47	14.68	2.51	2.34	0.63	1.05	0	35.99
1921-22	0	0	0.16	0.36	0.94	13.63	3.03	11.99	3.55	0.34	0.52	0.03	34.56
1922-23	0	0	0	3.00	6.79	11.13	4.72	2.27	0.07	3.74	0.02	0.11	31.85
1923-24	0	0	0.88	0.17	0.36	1.54	5.45	1.31	2.17	0.32	0.02	0	12.22
1924-25	0	0	0	2.95	2.54	2.95	1.62	8.17	2.83	2.56	3.86	0	27.48
1925-26	0	0	0.41	0.73	1.44	2.56	7.89	13.57	0.16	8.60	0.13	0	35.49
1926-27	0	0	0	2.03	9.72	1.43	4.81	10.26	2.40	4.45	0.13	0.24	35.47
1927-28	0	0	0.02	1.49	4.99	4.57	2.39	3.99	6.44	2.38	0.06	0	26.33
1928-29	0	0	0	0	4.06	4.04	0.74	3.88	2.95	1.85	0	0.91	18.43
1929-30	0	0	0	T	0	4.84	7.13	4.49	8.14	1.45	0.36	0	26.41
1930-31	0	T	0.10	0.15	1.98	0.70	6.76	1.08	1.32	0.51	1.27	0.30	14.17
1931-32	0	0	0.01	0.74	2.73	16.60	4.29	5.07	0.62	1.02	0.20	0	31.28

* Synthesized Data ** Double-Mass Adjusted

1923-24	0	0	0.86	0.26	0.06	1.08	2.21	0.19	2.74	0.86	0	0	8.26
1924-25	0	0	0	1.43	2.13	3.59	0.20	4.95	1.53	2.19	1.62	0	17.64
1925-26	0	0	0	0	0.91	1.35	3.00	5.78	0.21	3.27	0.35	0	14.87
1926-27	0	0	0	0.54	6.45	1.10	2.11	7.97	1.61	3.37	0.48	0	23.63
1927-28	0	0	0.21	0.89	3.28	2.28	0.84	1.74	6.15	1.02	0.26	0	16.67
1928-29	0	0	0	0	3.30	3.54	1.15	2.06	1.51	1.23	0	0.74	13.53
1929-30	0	0	0	0	0	4.35	4.55	3.67	2.58	0.90	0.34	0	16.39
1930-31	0	0	0.99	0	2.39	0	5.24	1.29	0.86	0.92	0.91	0.23	12.83
1931-32	0	0	0	0.79	2.24	12.77	2.94	5.03	0.55	0.23	0.35	0	24.90
1932-33	0	0	0	0	0.13	2.23	7.65	0.72	1.70	0.43	1.35	0	14.21
1933-34	0	0	0	1.22	0	5.95	1.20	3.48	0	0	0	0.86	12.71
1934-35	0	0	0.45	0.35	4.38	2.42	4.68	0.29	5.48	4.27	0	0	22.32
1935-36	0	0.22	0.11	0.47	0.62	1.72	5.00	9.76	1.53	2.29	0.38	0.28	22.38
1936-37	0	0	0	0.82	0	5.03	4.69	7.65	6.37	0.67	0	0.48	25.71
1937-38	0	0	0	0	1.14	8.37	3.55	11.28	6.75	1.63	0	0	32.72
1938-39	0	0	0.10	1.33	0.62	0.99	3.57	2.22	2.56	0.41	0.79	0	12.59
1939-40	0	0	0.17	0.79	0.19	0.75	10.65	8.31	3.65	0	0	0	24.51

* Synthesized Data ** Double-Mass Adjusted

May 1964

TABLE 4-3
(Continued)

MONTHLY AND ANNUAL PRECIPITATION IN INCHES **
Los Gatos Composite

YEAR	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	ANNUAL TOTAL
1932-33	0	0	0	T	0.99	3.01	8.99	0.97	3.35	0.08	1.20	T	18.59
1933-34	0	0	0	2.07	0	12.17	2.80	7.20	0.01	0.26	0.45	0.60	25.56
1934-35	0	T	0.42	0.83	4.33	4.45	9.00	0.50	6.17	5.05	0	0	30.75
1935-36	0	0.44	0.03	0.53	0.48	2.31	4.14	11.04	1.07	1.44	0.87	0.48	22.83
1936-37	0.01	T	0	0.39	0.02	5.73	4.83	8.20	7.98	0.45	0	0.40	28.01
1937-38	T	0	0	0.86	3.57	9.97	5.97	18.62	9.29	1.98	0.22	0	50.48
1938-39	0	0	0.09	1.54	1.85	1.54	4.09	2.49	4.21	0.74	0.56	T	17.11
1939-40	T	0	0.24	0.78	0.47	2.38	13.16	14.52	5.66	0.44	0.96	T	38.61
1940-41	T	0	0.35	0.90	0.89	15.51	9.80	10.72	9.65	6.56	1.72	0.09	56.19
1941-42	0	T	0.01	0.79	1.08	12.58	10.03	4.33	3.99	6.93	1.56	0	41.30
1942-43	0	0	0.09	0.98	3.76	2.72	14.84	2.49	4.02	1.27	0	0.06	30.23
1943-44	0	0	0	0.63	0.86	1.99	3.60	9.82	3.11	1.85	1.15	0.09	23.10
1944-45	0	0	0	2.90	5.00	3.31	1.09	10.28	4.71	0.43	1.15	T	28.87
1945-46	T	T	T	6.41	2.38	11.60	0.86	2.90	3.82	0.04	0.93	0	28.94
1946-47	0.06	0	0.01	0.05	6.19	2.83	1.23	2.97	3.75	0.13	0.42	0.44	18.08
1947-48	0	0	0	3.86	0.76	2.01	0.22	1.87	4.60	7.07	0.66	T	21.05
1948-49	0	T	T	0.40	0.18	7.25	1.81	4.65	10.43	T	0.58	0	25.30
1949-50	T	0.14	0.04	0.18	2.08	2.71	7.91	3.54	1.57	2.41	0.74	0	21.32
1950-51	T	0	0.02	4.52	10.58	7.82	3.90	2.65	1.77	1.04	1.47	0.01	33.78
1951-52	0	T	T	1.32	4.14	11.37	15.82	2.46	8.77	1.24	0.47	0.40	45.99
1952-53	T	0	T	0.02	3.42	12.15	4.50	T	3.76	2.28	0.71	0.03	26.87
1953-54	0	0.03	T	0.24	3.85	0.39	5.62	6.17	5.72	1.45	0.17	0.21	23.85
1954-55	0	0.02	T	T	4.54	6.82	5.93	2.91	0.37	3.45	0.54	0	24.58
1955-56	0	T	0	0.01	2.31	26.56	7.77	4.49	0.17	3.18	1.11	0	45.60
1956-57	0.01	0	0.50	1.69	0.07	0.72	5.09	7.31	1.46	2.26	2.42	0.07	21.60
1957-58	0	0	0.62	1.61	0.47	5.91	6.19	13.69	10.02	8.81	0.49	0.15	47.96
1958-59	T	0	0.10	0.03	0.34	1.00	7.86	9.70	0.36	0.98	0.02	0	20.39
1959-60	0	0.02	3.75	0	0	0.97	6.17	4.71	1.29	1.56	0.43	0	18.90
1960-61	T	0	T	0.26	5.38	2.47	2.23	1.28	3.32	1.24	0.53	0.12	16.83
1961-62	T	0.15	0.16	0.07	4.57	2.37	1.84	12.74	5.00	0.03	0	0	26.93
1962-63	0	0	0	11.26	0.28	3.09	10.00	*4.39	5.02	6.02	0.56	0	40.62

	Double-Mass Adjustment Factor	Composite Station Index Number
1885-86 to 1929-30		512260
1930-31 to 1932-33		512280
1933-34 to 1945-46		512290
1946-47 to 1962-63		512300
1885-86 to 1912-13	1.0000	
1913-14 to 1914-15	0.7630	
1915-16 to 1931-32	1.0706	
1932-33 to 1945-46	1.1020	
1946-47 to 1962-63	1.0000	

* Synthesized Data ** Double-Mass Adjusted

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May 1964

TABLE 4-5

MONTHLY AND ANNUAL PRECIPITATION IN INCHES **
Palo Alto Composite

YEAR	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	ANNUAL TOTAL
1906-07	0	0	0.20	0	0.75	3.76	3.75	1.42	9.68	0.16	0	0	19.72
1907-08	0	0	0	0.96	0	4.02	2.04	4.07	1.29	0.19	0.26	0	12.83
1908-09	0	0	0	0.21	0.68	1.86	9.29	4.34	2.03	T	0	0	18.41
1909-10	0	0	0.83	0.70	1.52	4.12	2.63	0.81	2.41	0.14	0	0.01	13.17
1910-11	0	0	0	0.21	0.12	0.50	12.58	2.23	4.64	0.95	0.36	0.02	21.61
1911-12	0	0	0	0.56	0.25	1.52	1.42	0.19	2.64	1.35	0.83	0.73	9.49
1912-13	0	0	0.56	0.16	0.44	0.48	2.55	0.33	1.10	0.35	0.47	0.05	6.49
1913-14	0.06	0.02	0	0.06	3.98	4.75	6.24	3.53	0.65	0.70	0.14	0.19	20.32
1914-15	0	0	0	0.52	1.11	3.83	4.85	6.49	1.56	0.98	2.45	0	21.79
1915-16	0	0	0.01	0.01	0.43	4.11	10.85	1.51	1.01	0.02	0.01	0	17.96
1916-17	0	0.13	0.47	1.08	0.46	3.61	0.62	3.57	0.61	0.26	0.09	0	10.90
1917-18	0	0	0.02	0	0.40	0.47	0.46	2.47	3.00	0.45	0	0	7.28
1918-19	0	0	4.54	0.17	3.33	1.10	1.09	6.36	2.06	0.02	0	0	18.67
1919-20	0	0.02	0.43	0.14	0.06	3.37	0.11	1.06	2.96	0.61	0	0.24	9.00
1920-21	0	0	0.04	2.66	2.40	4.89	6.50	0.99	1.61	0.50	1.26	0	20.85
1921-22	0	0	0.19	0.40	1.45	4.41	2.33	6.45	1.81	0.17	0.43	0.02	17.66
1922-23	0	0	0	3.15	2.39	5.44	1.80	0.71	0.22	2.21	0	0.16	16.08
1923-24	0	0	0.99	0.26	0.14	0.71	1.80	0.83	1.74	0.30	0.13	0	6.89
1924-25	0	0	0	1.55	0.76	2.92	1.14	4.68	2.20	1.38	3.15	0.02	17.80
1925-26	0	0	0.07	0.14	1.18	1.38	4.05	4.53	0.21	2.88	0.38	0	14.82
1926-27	0	0.01	0	1.27	3.59	1.32	2.20	4.49	1.72	2.40	0.01	0.30	17.31
1927-28	0	0	0	0.92	1.95	2.64	1.40	2.05	3.24	1.24	0.66	0	14.09
1928-29	0	0	0	0.02	1.89	2.89	0.87	1.15	1.02	1.10	0.06	1.20	10.20
1929-30	0	0	0	0.16	0	1.82	5.51	3.01	2.59	0.70	0.09	0.01	13.89
1930-31	0	0.08	0.17	0.76	1.07	0.58	3.83	1.21	0.73	0.43	0.78	0.26	9.90
1931-32	0	0	0	0.22	2.20	6.85	2.62	3.36	0.08	0.32	0.49	0	16.14
1932-33	0	0	0	0	0.51	2.39	4.64	0.47	2.15	0.10	0.77	0.02	11.05
1933-34	0	0	0	0.66	0	4.34	0.68	2.47	0	0.38	0.39	0.55	9.47
1934-35	0	0	0.30	0.38	2.60	2.68	4.29	1.56	2.47	3.39	0	0	17.67
1935-36	T	0.43	0.04	1.23	0.32	1.55	2.86	6.43	0.88	1.02	0.13	0.57	15.46
1936-37	0.03	0	0	0.62	0.02	4.50	3.22	3.95	5.17	0.70	0.04	0.20	18.45
1937-38	0	0	0	0.76	2.70	3.24	3.47	5.63	3.92	1.20	0.01	0	20.94
1938-39	0	0	0.08	1.20	1.24	1.39	2.73	1.25	1.24	0.58	0.51	0.01	10.23
1939-40	0	0	0.54	1.03	0.24	0.52	7.29	7.68	3.45	0.46	0.22	0	21.43
1940-41	0	0	0.30	0.41	0.39	6.48	4.63	5.48	2.96	3.03	0.43	0.06	24.17
1941-42	0	0	0	0.85	0.60	5.57	3.56	2.29	1.75	2.76	0.93	0	18.31
1942-43	0	0	0.15	1.38	2.36	2.03	4.85	1.98	3.13	1.44	0	0.01	17.33
1943-44	0	0	0	0.49	0.49	1.75	1.94	4.85	0.45	0.70	0.43	0.02	11.12
1944-45	0	0	0	1.24	3.56	2.63	0.42	3.42	2.61	0.22	0.51	0	14.61
1945-46	0	0	0.02	1.47	1.67	4.17	0.71	1.70	1.73	0.13	0.56	0	12.16
1946-47	0.18	0	0.04	0.08	3.54	2.44	0.63	1.13	2.27	0.07	0.24	0.21	10.83
1947-48	0	0	0	2.24	0.86	1.00	0.12	1.16	2.30	2.83	0.96	0	11.47
1948-49	0	0	0	0.34	0.05	3.28	0.74	2.60	3.88	0	0.32	0.02	11.23
1949-50	0.13	0.18	0.03	0.14	1.29	1.19	5.24	1.66	1.37	0.73	0.47	0	12.43
1950-51	0	0	0	1.44	5.37	5.58	2.25	1.22	0.72	0.74	0.69	0.10	18.11
1951-52	0	0	0.04	0.77	2.28	7.20	5.96	1.48	3.62	1.14	0.10	0.03	22.62

* Synthesized Data   ** Double-Mass Adjusted

May 1964

TABLE 4-5
(Continued)

MONTHLY AND ANNUAL PRECIPITATION IN INCHES **
Palo Alto Composite

YEAR	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	ANNUAL TOTAL
1952-53	0.01	0	0	0.01	1.81	7.53	2.14	0.03	1.15	1.40	0.35	0.15	14.59
1953-54	0	0.07	0	0.26	1.87	0.21	2.37	1.78	3.26	0.54	0.04	0.21	10.61
1954-55	0	0	0	0.01	1.10	2.79	4.19	1.38	0.04	0.84	0.87	0	11.22
1955-56	0.02	0	0	0	1.16	10.56	6.66	1.32	0.12	0.70	1.08	0	21.62
1956-57	0	0	0.24	0.54	0.02	0.59	2.70	3.03	1.51	0.95	1.88	0.03	11.49
1957-58	T	0	0.32	1.05	0.43	2.89	3.49	5.85	5.21	4.56	0.46	0.15	25.46
1958-59	0	0	0.07	0.06	0.13	0.86	3.63	3.70	0.12	0.02	0	0	8.59
1959-60	0	0.01	2.31	0	T	1.31	3.54	3.06	0.60	0.76	0.22	0	11.81
1960-61	T	0	T	0.01	2.67	0.84	1.73	0.65	1.89	0.51	0.55	0.04	8.89
1961-62	0	0.04	0.27	0.10	2.66	1.23	1.18	6.45	2.21	0.13	0	0	14.27
1962-63	0	T	T	2.92	0.41	2.30	1.88	3.66	2.37	3.05	0.51	0.02	17.12

	Double-Mass Adjustment Factor	Composite Station Index Number
1906-07 to 1909-10		664201
1910-11 to 1952-53		664202
1953-54 to 1962-63		664600
1906-07 to 1919-20	0.8180	
1920-21 to 1935-36	1.0423	
1936-37 to 1952-53	0.9405	
1953-54 to 1962-63	1.0000	

* Synthesized Data ** Double-Mass Adjusted

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May 1964

TABLE 4-6

MONTHLY AND ANNUAL PRECIPITATION IN INCHES **
San Jose 782100

YEAR	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	ANNUAL TOTAL
1874-75	0	0	0.10	1.81	1.91	0.08	2.75	0.41	0.39	T	T	0.45	7.90
1875-76	0	0	0	T	6.10	2.12	4.08	3.41	3.11	0.41	0.25	0	19.48
1876-77	T	0	0.11	1.17	0.01	0	2.23	0.48	0.78	0	0.05	0	4.83
1877-78	0	0	0	0.37	0.85	1.87	5.53	6.94	2.22	1.48	0.02	0	19.28
1878-79	0	0	0.48	0.80	0.76	0.97	1.48	3.18	5.85	1.24	1.58	0.06	16.40
1879-80	0	0	0	0.87	1.79	2.99	1.52	1.34	0.96	3.66	0.67	0	13.80
1880-81	0	0	0	0	0.49	5.60	2.12	2.04	0.80	1.28	0	0.12	12.45
1881-82	0	0	0.02	0.45	0.88	1.83	1.17	1.49	4.26	1.10	0.55	0	11.75
1882-83	0	0	0.04	0.87	1.32	0.82	1.86	0.94	2.70	0.66	2.18	0	11.39
1883-84	0	0	0.09	0.67	0.28	0.37	3.18	3.68	6.23	3.38	0.05	2.15	20.08
1884-85	0	0	0.06	1.24	0.05	3.23	1.52	0.15	0.71	2.28	0.09	T	9.35
1885-86	0	0	0	0.05	6.13	1.75	2.98	0.93	1.57	3.70	0	0	17.11
1886-87	0.02	0	0	0.41	0.61	0.59	0.56	5.65	0.52	1.06	0	0	9.42
1887-88	0.02	0	0.51	0.02	0.58	2.10	2.54	0.90	2.49	0.26	0.50	0.17	10.09
1888-89	0	0	0.50	0	3.22	2.02	0.41	0.58	4.81	0.66	0.80	0.03	13.03
1889-90	0	0	0	3.72	1.43	8.75	5.41	3.02	1.72	0.46	0.62	0	25.13
1890-91	0	0	0.04	0	0.04	1.99	0.46	4.37	2.04	1.48	0.22	0.04	10.68
1891-92	0	0	0.31	0.06	0.38	4.84	0.92	1.33	3.94	0.54	1.33	0.04	13.69
1892-93	0	0	0	0.83	3.32	6.44	2.45	2.22	4.25	1.11	0.25	0	20.87
1893-94	0	0	0	0	0.67	1.40	3.92	2.16	0.57	0.53	1.13	0.33	10.71
1894-95	0	0	0.90	1.08	0.46	6.47	5.21	1.18	1.21	1.70	1.13	0	19.34
1895-96	0	0	0.04	0.69	0.90	0.70	4.29	0.22	1.84	2.31	0.36	0	11.35
1896-97	0.01	0.61	0.27	1.08	2.34	2.11	1.39	2.84	2.19	0.76	0.13	T	13.73
1897-98	0	0	0.17	0.84	0.31	1.00	0.77	1.60	0.43	0.17	0.36	0.05	5.70
1898-99	0	0	1.10	0.59	0.43	0.42	1.83	0.20	4.05	0.47	0.64	T	9.73
1899-00	0	0	0	3.17	2.62	1.39	1.99	0.43	1.32	1.61	0.93	0.01	13.47
1900-01	0.02	0	0.17	0.60	4.24	1.28	3.87	5.31	0.73	2.30	0.81	T	19.31
1901-02	0	T	0.43	0.97	1.03	0.42	0.79	4.29	2.57	1.26	0.85	0	12.61
1902-03	0	0	0	0.92	2.12	0.89	2.66	1.23	4.85	0.82	0	0	13.49
1903-04	0	0	0	0.12	0.96	0.33	1.24	2.92	2.65	1.69	0.26	0	10.17
1904-05	0	0.24	1.88	1.39	1.17	2.21	2.62	2.58	2.65	0.98	1.73	0	17.45
1905-06	0	0	T	0	2.11	1.19	2.78	2.24	4.32	0.87	0.73	0.42	14.66
1906-07	0	0	0.11	0.01	0.87	5.65	4.08	1.66	6.85	0.41	0.07	0.36	20.07
1907-08	T	0	0.05	0.87	0.11	3.23	2.33	2.17	1.01	0.20	0.59	0.01	10.57
1908-09	0	0	0.08	0.17	0.98	1.36	6.80	4.31	2.44	0	0	0.04	16.18
1909-10	0	0	0.66	0.64	1.12	4.78	2.04	0.73	2.52	0.36	T	0.02	12.87
1910-11	T	0	0.08	0.18	0.25	0.60	10.94	1.79	5.53	0.40	0.19	0.06	20.02
1911-12	0	0	0	0.72	0.16	1.79	1.20	0.27	2.48	1.72	0.62	0.40	9.36
1912-13	T	0	0.62	0.19	0.26	0.38	2.01	0.08	1.04	0.34	0.68	0.01	5.61
1913-14	0.08	0.07	T	0.02	3.62	2.65	5.51	3.48	0.80	0.57	0.17	0.22	17.19
1914-15	0	0	0	0.44	1.20	3.30	4.29	6.21	1.32	0.94	2.37	0	20.07
1915-16	0	0.04	0	0	0.17	3.86	7.70	1.62	0.97	0.05	0.01	T	14.42
1916-17	T	0.01	0.69	0.74	0.36	3.08	0.87	4.31	0.68	0.23	0.19	0	11.16
1917-18	T	0	0.01	0	0.48	0.49	0.62	2.32	3.95	0.40	T	0	8.27
1918-19	0	0	5.60	0.13	1.98	1.13	0.94	4.30	2.54	0.05	0.01	T	16.68
1919-20	T	0.01	0.22	0.25	0.08	2.19	0.09	0.92	3.03	0.81	T	0.19	7.79

* Synthesized Data ** Double-Mass Adjusted

MONTHLY AND ANNUAL PRECIPITATION IN INCHES **

San Jose 782100

YEAR	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	ANNUAL TOTAL
1920-21	0	0	0.02	1.51	1.63	3.16	4.20	0.97	0.71	0.35	0.73	T	13.28
1921-22	0	0	0.18	0.18	1.46	4.13	2.18	2.66	1.54	0.28	0.44	0.01	13.06
1922-23	T	T	0	1.37	2.40	4.14	1.71	0.90	0.27	1.34	0.02	0.09	12.24
1923-24	0	0.01	0.55	0.26	0.27	0.63	1.50	0.55	1.65	0.33	0.04	0	5.79
1924-25	0	T	T	1.52	1.11	1.70	0.76	2.73	1.66	1.37	1.73	0.01	12.59
1925-26	0.02	0	0.01	0.42	0.85	1.18	2.75	4.73	0.11	2.54	0.18	0	12.79
1926-27	0	T	0	0.27	3.04	1.03	1.83	3.55	1.40	0.91	0.07	0.17	12.27
1927-28	T	T	0.02	0.83	1.25	2.01	0.98	1.78	2.12	0.96	0.15	0.01	10.11
1928-29	0	0	0	0.01	2.47	2.40	0.86	0.61	1.31	0.92	0.11	1.45	10.14
1929-30	0	0	0	T	0	0.78	3.49	1.86	2.93	0.76	1.01	T	10.83
1930-31	0	0.01	0.05	0.23	0.73	0.49	3.56	1.20	0.54	0.40	1.08	0.07	8.36
1931-32	0	T	T	0.10	1.79	5.57	2.28	2.52	0.45	0.20	0.48	0	13.40
1932-33	0	T	0	T	0.36	2.02	4.12	0.40	1.47	0.15	0.37	T	8.89
1933-34	0	T	0.01	0.78	0	3.05	0.41	2.60	T	0.34	1.23	0.33	8.75
1934-35	0	T	0.23	0.52	2.19	2.78	3.65	0.81	2.62	3.38	T	0	16.18
1935-36	T	0.54	T	0.99	0.11	1.05	1.50	5.74	0.73	0.88	0.75	0.12	12.41
1936-37	0.03	T	0	0.83	0.01	3.08	2.69	3.45	5.97	0.74	0.03	0.10	16.93
1937-38	0	0	0	0.62	1.27	2.57	4.13	5.46	3.40	1.12	T	0	18.57
1938-39	T	0	0.18	1.12	1.21	1.31	2.47	1.49	2.15	0.45	0.29	T	10.68
1939-40	T	T	0.28	0.88	0.17	0.55	4.81	6.15	3.04	0.47	0.10	T	16.45
1940-41	0	0	0.18	0.31	0.59	5.01	3.54	5.05	3.16	3.20	0.36	0.02	21.42
1941-42	0	0.01	T	0.64	0.37	4.93	3.95	1.48	1.84	2.79	0.48	0.01	16.50
1942-43	T	T	0.07	1.01	1.19	1.23	4.02	1.82	2.71	1.13	T	0.02	13.20
1943-44	0	0	0	0.25	0.37	0.97	1.98	5.90	0.78	0.90	0.28	0.04	11.47
1944-45	T	0	0	1.77	2.76	2.05	0.37	2.39	2.49	0.22	0.28	0.10	12.43
1945-46	0	0.01	0	1.19	1.19	3.95	0.81	1.72	1.49	0.01	0.86	0	11.23
1946-47	T	0	0.04	0.02	1.76	2.30	0.62	1.57	1.76	0.51	0.22	0.24	9.04
1947-48	0	0	0	1.29	0.81	0.72	0.16	1.15	1.97	3.19	0.56	0.04	9.89
1948-49	0	0	T	0.38	0.09	3.56	0.58	1.83	4.61	T	0.43	0	11.48
1949-50	0.01	0.10	T	0.25	0.94	1.08	3.20	0.84	0.98	0.75	0.16	T	8.31
1950-51	T	T	0.11	1.61	3.20	3.85	1.87	1.80	0.50	0.53	0.53	0.01	14.01
1951-52	0	T	0.22	0.55	2.14	4.06	6.34	0.92	4.16	1.26	0.08	0.02	19.75
1952-53	0.04	0	T	0.01	1.42	4.56	1.40	0.02	0.96	0.75	0.38	0.08	9.62
1953-54	0	0.09	0	0.20	1.74	0.50	2.21	1.72	2.99	0.39	0.12	0.12	10.08
1954-55	0	T	T	T	1.32	2.96	4.13	1.53	0.05	1.12	0.74	T	11.85
1955-56	T	T	T	0.01	1.06	9.26	4.66	0.87	0.07	1.01	1.15	0	18.09
1956-57	0	0	0.45	0.52	T	0.47	2.79	2.72	0.82	0.94	1.21	0.12	10.04
1957-58	T	0	0.27	0.92	0.22	2.75	2.91	5.39	4.83	3.68	0.53	0.41	21.91
1958-59	T	0.03	0.04	0.01	0.23	0.60	3.05	4.95	0.25	0.60	0.02	0	9.77
1959-60	0	T	2.04	0	0	0.63	2.91	3.27	0.48	0.80	0.28	0	10.41
1960-61	0.02	0	T	0.05	2.87	1.29	1.36	0.80	2.03	0.76	0.59	0.12	9.89
1961-62	T	0.04	0.14	0.06	2.63	1.28	0.81	5.61	1.95	0.10	T	0	12.62
1962-63	0	T	T	4.59	0.28	2.00	3.99	2.23	3.53	*3.60	*0.95	0.02	21.19

Double-Mass Adjustment Factors

1874-75 to 1883-84	1.0000	1906-07 to 1926-27	0.8840
1884-85 to 1897-98	0.8293	1927-28 to 1962-63	1.0000
1898-99 to 1905-06	0.9714		

* Synthesized Data ** Double-Mass Adjusted

Carroll E. Bradberry & Associates
CONSULTING ENGINEERS
LOS ALTOS • CALIFORNIA
INCORPORATED

May 1964

TABLE 4-7

MONTHLY AND ANNUAL PRECIPITATION IN INCHES **
Wrights Composite

YEAR	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	ANNUAL TOTAL
1899-00	0	2.23	0	0	7.53	4.44	11.28	11.55	0.98	7.60	1.78	0	47.39
1900-01	T	0	0.46	2.87	14.77	1.90	2.28	21.96	8.43	4.30	1.18	0.48	58.63
1901-02	0	0	1.94	1.58	5.34	1.21	8.93	4.27	13.74	0.50	0	0	37.51
1902-03													
1903-04													
1904-05													
1905-06													
1906-07	0	0	0	0	3.59	15.02	11.10	4.46	23.79	0.31	0	1.23	59.50
1907-08	0	0.10	0.25	2.11	0	10.48	6.12	7.22	2.94	0.91	0.92	0	31.05
1908-09	0	0	0.18	0.91	2.35	3.74	34.50	14.80	6.38	0	0	0.24	63.10
1909-10	0	0	0.83	1.40	2.35	11.14	10.30	2.82	6.43	1.07	0	T	36.34
1910-11	0	0	0.16	1.39	1.43	2.70	37.78	5.28	16.37	4.06	0.78	0.11	70.06
1911-12	T	0	T	2.13	0.96	3.40	5.12	0.37	6.21	5.22	2.34	0.52	26.27
1912-13	0	0	2.66	0.53	1.76	1.89	9.69	0.44	3.46	0.61	1.46	0.12	22.62
1913-14	0.37	0	0	T	8.78	16.16	35.62	11.02	1.33	1.92	1.27	0.62	77.09
1914-15	0	0	0	1.90	0.64	10.85	10.62	16.43	4.13	1.75	7.33	0	53.65
1915-16	T	0	T	T	1.21	15.10	25.40	6.20	2.88	0.04	0.41	0	51.24
1916-17	0.08	T	0.68	1.28	0.75	14.74	2.26	19.97	1.62	0.90	0.13	0	42.41
1917-18	T	0	T	0	0.92	2.51	0.88	7.14	7.82	0.37	0	0	19.64
1918-19	0	0	10.66	0.18	8.44	4.54	4.09	19.68	10.53	0.06	0	0	58.18
1919-20	0	0	1.09	0.85	0.24	6.94	1.11	2.38	10.21	13.07	0	0.75	36.64
1920-21	0	0.33	0.12	4.38	25.44	18.52	12.89	0.68	2.94	1.35	1.58	0.20	68.43
1921-22	0	0	0.35	0.47	1.73	16.46	3.29	12.72	4.75	0.59	1.13	0.23	41.72
1922-23	T	0	0	3.29	7.71	18.44	6.59	2.04	T	7.59	0	0.78	46.44
1923-24	0	T	0.75	0.27	0.51	2.29	7.02	2.43	2.79	0.63	0.05	0.01	16.75
1924-25	0	T	0.02	6.09	4.21	4.70	2.46	11.60	4.52	3.43	6.93	0.14	44.10
1925-26	0.21	0	1.45	0.22	1.60	3.12	9.73	16.13	0.34	10.52	0.33	T	43.65
1926-27	0	T	0	2.85	12.15	1.85	9.95	15.71	3.55	9.55	0.54	0.52	56.67
1927-28	0	0	0.06	1.32	9.95	7.57	2.90	6.49	13.72	3.86	0.20	T	46.07
1928-29	0	0	0	T	6.20	6.47	1.55	6.28	3.49	2.44	0	1.93	28.36
1929-30	0	0	0.01	0	0	10.41	9.68	6.13	9.71	1.99	0.59	0	38.52
1930-31	0	T	0.58	0.10	3.72	1.15	9.21	1.22	3.05	0.80	2.20	1.26	23.29
1931-32	T	T	T	1.75	4.64	25.06	5.60	6.73	2.51	1.33	0.89	0	48.51
1932-33	0	0.02	0	0.02	1.51	4.14	12.02	1.23	5.86	0.46	2.14	T	27.40
1933-34	0.02	0.10	0.23	4.63	0	16.99	2.49	10.92	0	0.88	1.57	1.62	39.45
1934-35	0	0.01	0.42	2.10	6.50	5.09	12.27	1.94	7.87	10.34	0	0	46.54
1935-36	0	0.54	0.02	2.05	1.27	4.61	10.74	20.13	1.95	3.40	1.94	0.98	47.63
1936-37	0.23	0	T	0.93	0.03	7.82	7.31	16.14	14.21	1.09	0.10	1.05	48.91
1937-38	0	0	0	1.66	6.23	15.85	11.27	18.69	15.12	2.57	0.27	0	71.66
1938-39	0	0	0.15	3.93	2.31	1.68	6.43	3.85	6.06	0.58	1.99	0	26.98
1939-40	0	0	0.49	1.00	0.70	2.69	24.47	21.74	10.55	1.00	1.76	0	64.40
1940-41	0.27	0.05	0.24	2.54	1.63	19.13	15.20	17.78	10.88	8.50	3.20	0.18	79.60
1941-42	0.03	0.01	0	1.27	2.63	16.48	14.40	7.03	5.43	8.23	2.79	0	58.30
1942-43	0	0	0.08	1.44	7.20	4.52	18.73	3.84	7.93	2.39	0.12	0.08	46.33
1943-44	0	0	0	1.61	1.53	3.54	7.05	14.61	3.65	3.59	1.68	0.34	37.60
1944-45	0.02	0	0	4.02	9.28	5.28	1.95	14.36	7.14	0.57	1.92	0.07	44.61

* Synthesized Data ** Double-Mass Adjusted

May 1964

TABLE 4-7
(Continued)

MONTHLY AND ANNUAL PRECIPITATION IN INCHES **
Wrights Composite

YEAR	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	ANNUAL TOTAL
1945-46	0	T	T	7.15	4.19	15.91	1.53	4.00	5.00	0.12	1.69	0	39.59
1946-47	T	0	0.09	0.21	10.38	3.49	1.65	5.13	6.82	0.37	1.11	1.11	30.34
1947-48	0	0	T	7.64	1.22	4.03	1.69	2.26	6.76	11.18	2.40	0.10	37.28
1948-49	0	T	T	0.71	0.63	9.26	2.47	6.04	14.68	T	0.94	0	34.73
1949-50	0.09	0.24	0.23	0.14	4.15	4.42	10.92	7.17	2.75	2.29	1.43	0.12	33.95
1950-51	T	0	0.72	6.12	18.52	12.94	6.72	3.16	3.08	1.81	1.82	0.06	54.95
1951-52	0	0.08	T	2.53	6.03	16.81	19.37	4.42	11.56	2.16	0.63	1.27	64.86
1952-53	T	0	0.15	0.06	5.12	16.38	8.58	0	6.62	4.72	0.72	0.18	42.53
1953-54	0	0.33	0	0.67	5.96	0.85	9.64	9.25	9.01	3.73	0.52	0.44	40.40
1954-55	0	0.37	0.03	0.09	8.31	10.10	7.85	3.88	0.90	6.13	0.54	0	38.20
1955-56	0	0	0	0.10	2.90	36.59	11.82	6.17	0.17	4.98	1.67	0	64.40
1956-57	0.03	0	0.44	3.23	0.06	1.34	7.30	11.75	3.51	3.25	6.24	0.20	37.35
1957-58	0	0	1.17	4.26	1.15	7.79	9.11	18.68	13.01	11.40	0.23	0.45	67.25
1958-59	0.06	0	0.17	T	0.55	2.11	15.81	11.09	0.65	1.65	0.02	0	32.11
1959-60	0	0	8.44	0	0	0.94	10.55	8.96	2.99	2.80	1.33	0	36.01
1960-61	0.05	0	0.02	0.31	9.55	2.43	3.63	1.68	5.90	1.65	1.07	0.23	26.52
1961-62	0	0.09	0.27	0.22	7.13	3.71	2.88	22.62	7.32	0.42	0	0	44.66
1962-63	0	0.22	0	18.07	0.92	6.07	15.91	8.94	6.33	10.49	0.76	0	67.71

	Double-Mass Adjustment Factor	Composite Station Index Number
1899-00 to 1917-18		981300
1918-19 to 1962-63		981400
1899-00 to 1918-19	1.0593	
1919-20 to 1920-21	0.7895	
1921-22 to 1962-63	1.0000	

* Synthesized Data ** Double-Mass Adjusted

Carroll E. Bradberry & Associates
CONSULTING ENGINEERS
LOS ALTOS · CALIFORNIA
INCORPORATED

May 1964

TABLE 4-8

MONTHLY AND ANNUAL PRECIPITATION IN INCHES **
Shanti Ashrama 813000

YEAR	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	ANNUAL TOTAL
1912-13	0	0	1.49	0.70	1.73	0.53	4.49	0.56	1.19	0.45	0.37	0.57	12.08
1913-14	0.09	0.09	0	0	4.99	4.63	15.83	5.96	0.74	1.41	0.27	0.39	34.40
1914-15	0	0	0	0.53	0.30	5.74	5.33	8.76	2.29	1.54	0.82	0	25.31
1915-16	0	0	0	0	0.70	5.03	14.98	3.11	1.85	0.33	0.22	0	26.22
1916-17	0	0	0.43	0.39	0.47	7.02	0.84	8.48	0.82	0.35	0.25	0	19.05
1917-18	0	0	0.07	0	0.62	1.24	0.57	5.33	4.64	0.55	0	0	13.02
1918-19	0	0	5.07	0	4.02	1.74	1.21	8.19	2.73	0.08	0	0	23.04
1919-20	0	0.01	0.36	0.29	0.10	3.86	0.38	1.29	5.13	1.68	0	0.16	13.26
1920-21	0	0	0	2.37	3.10	4.30	5.58	1.12	1.54	0.23	1.52	0	19.76
1921-22	0	0	0.23	0.09	0.81	8.18	2.24	7.92	2.42	0.35	0.36	0	22.60
1922-23	0	0	0	0.67	3.26	7.80	3.54	1.26	0.48	3.26	0	0.03	20.30
1923-24	0	0	0.64	0.25	0.13	0.94	2.30	0.49	2.86	0.28	0.11	0	8.00
1924-25	0	0	0	2.05	2.07	3.03	1.61	5.43	1.54	2.15	1.57	0	19.45
1925-26	0.02	0	0.05	0.10	0.85	1.70	3.47	8.53	0.18	5.77	0.14	0	20.81
1926-27	0	0	0	0.79	7.47	1.16	2.26	7.74	2.01	1.55	0.18	0.29	23.45
1927-28	0	0	0.05	1.57	2.80	3.26	0.85	1.87	6.28	0.91	0	0	17.59
1928-29	0	0	0	0.02	2.83	3.93	1.31	2.33	2.66	1.19	0	1.07	15.36
1929-30	0	0	0.01	0.93	0	2.98	4.92	2.80	5.81	1.31	0.30	0	19.06
1930-31	0	0.25	0.07	0.64	1.95	0.23	4.98	2.19	0.89	0.66	1.13	0.01	13.00
1931-32	0	0	0.01	0.29	2.22	12.18	2.98	4.46	0.55	0.17	0.18	0	23.04
1932-33	0.02	0	0	0	0.37	2.34	6.20	0.72	1.96	0.02	1.11	0.08	12.82
1933-34	0	0	0	1.97	0	8.32	4.09	0	0.01	0.67	0.87	0	15.93
1934-35	0	0.01	0.13	0.76	2.56	2.67	4.12	0.87	3.97	4.70	0	0	19.79
1935-36	0.01	0.03	0	0.64	0.77	1.95	5.32	10.91	1.13	1.59	0.55	0.18	23.08
1936-37	1.11	0.36	0	0.47	0.03	3.82	4.16	6.89	6.34	0.85	0	0.02	24.05
1937-38	0	0	0	0.14	1.36	8.29	3.17	11.59	6.07	1.15	0.60	0	32.37
1938-39	0	0	0.05	1.25	0.73	1.15	1.65	2.29	2.76	0.57	0.37	0.01	10.83
1939-40	0	0.01	0.44	0.31	0.09	1.46	10.28	8.12	2.48	0.33	0.09	0	23.61
1940-41	0	0	0.53	0.62	0.25	9.26	5.56	9.09	6.31	4.86	0.10	0.01	36.59
1941-42	0	0	0	0.88	0.63	8.48	4.46	2.78	2.22	4.05	0.91	0	24.41
1942-43	0	0	0	0.76	3.28	2.39	8.90	2.57	4.37	1.44	0	0	23.71
1943-44	0	0	0	0	0.44	2.15	4.11	7.70	1.72	1.43	0.95	0.21	18.81
1944-45	0	0	0	2.03	3.03	2.75	0.49	8.71	4.59	0.15	0.26	0.02	22.03
1945-46	0	0.05	0	1.94	1.74	6.94	1.40	1.87	3.26	0.07	0.57	0	17.79
1946-47	0.05	0	0	0.11	6.18	2.53	0.83	1.71	2.67	0.27	0.20	0.42	14.99
1947-48	0	0	0	2.33	0.72	*2.74	0.20	1.56	3.56	4.43	0.71	0.32	16.57
1948-49	0	0	0	0.42	0.14	4.46	1.52	2.00	5.71	0	0.25	0	14.50
1949-50	0	0.05	0	0.09	1.81	2.65	5.91	2.44	1.72	1.87	0.68	0	17.22
1950-51	0.07	0	0.14	2.32	8.29	6.10	2.76	1.91	1.25	0.91	0.51	0.05	24.31
1951-52	0	0	0.01	1.26	3.50	8.88	8.72	2.18	3.70	1.76	0.36	0.25	30.62

Double-Mass Adjustment Factors

1912-13 to 1936-37	1.0367
1937-38 to 1941-42	0.9094
1942-43 to 1951-52	1.0000

* Synthesized Data ** Double-Mass Adjusted

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INCORPORATED

May 1964

TABLE 7-1

LONG-TERM ANNUAL PRECIPITATION IN INCHES

Double-Mass Adjusted

WATER YEAR	STATION INDEX NUMBER**			
	338700	220500	668901	791200
1881-82				11.76
1882-83				10.86
1883-84				19.66
1884-85				10.06
1885-86				*20.47
1886-87				*15.55
1887-88				12.93
1888-89				15.92
1889-90				30.15
1890-91				13.57
1891-92				13.60
1892-93				24.72
1893-94				11.29
1894-95		40.08		22.50
1895-96		27.56		13.44
1896-97		31.34		17.02
1897-98		16.94	10.58	7.86
1898-99		28.47	22.10	11.29
1899-00		29.31	14.99	13.55
1900-01		32.00	28.95	18.79
1901-02		30.12	23.16	13.23
1902-03		27.15	20.54	15.66
1903-04		34.25	20.34	12.89
1904-05		32.27	23.46	20.13
1905-06		30.78	32.28	18.71
1906-07		39.24	33.77	25.19
1907-08		21.95	16.82	12.77
1908-09		38.18	29.17	20.39
1909-10		23.16	20.42	15.89
1910-11	21.93	39.74	29.65	22.66
1911-12	9.92	17.48	14.86	12.21
1912-13	9.56	18.07	9.52	6.57
1913-14	25.27	32.48	36.35	19.50
1914-15	20.78	41.09	24.92	26.97
1915-16	19.87	33.86	23.09	17.46
1916-17	14.32	25.43	20.06	12.58
1917-18	10.83	14.33	13.79	9.06
1918-19	20.83	34.10	20.66	20.84
1919-20	11.26	18.34	18.08	9.77
1920-21	17.06	34.62	24.47	16.24
1921-22	19.67	30.99	26.23	15.86
1922-23	16.30	27.79	25.58	14.38
1923-24	6.85	13.72	8.97	6.84
1924-25	15.83	32.44	18.21	16.34
1925-26	17.07	24.16	21.95	15.17
1926-27	19.36	30.52	26.94	15.14
1927-28	15.96	23.75	16.13	11.01
1928-29	13.01	18.94	14.98	9.47
1929-30	14.60	22.41	21.75	10.91
1930-31	13.95	17.74	12.79	9.36
1931-32	18.14	28.06	28.14	14.18
1932-33	10.04	20.20	14.82	9.07
1933-34	12.29	18.07	18.91	9.85
1934-35	18.36	31.78	19.35	17.38
1935-36	18.10	27.21	23.86	12.96
1936-37	20.59	33.22	27.93	18.98
1937-38	31.47	39.99	35.94	20.78
1938-39	12.15	18.47	13.30	11.08
1939-40	*21.20	35.47	26.46	18.12
1940-41	30.54	41.31	32.09	25.70
1941-42	19.98	38.70	29.27	18.80
1942-43	19.90	28.39	25.05	15.30
1943-44	16.14	23.52	19.59	11.55
1944-45	17.72	27.90	23.10	12.96
1945-46	15.73	27.27	17.25	12.74
1946-47	12.06	18.10	15.73	9.03
1947-48	12.90	21.42	15.09	10.89
1948-49	13.42	23.87	12.55	12.05
1949-50	14.37	24.69	17.56	7.96
1950-51	22.40	31.78	27.38	14.04
1951-52	26.38	44.82	34.25	19.17
1952-53	12.71	25.60	20.88	10.87
1953-54	13.21	20.82	16.51	10.53
1954-55	14.41	20.07	16.33	11.12
1955-56	26.72		31.01	19.45
1956-57	12.01		18.02	10.44
1957-58	29.95		36.92	22.74
1958-59	14.39	12.00	17.02	9.57
1959-60	15.30	16.33	20.76	10.31
1960-61	11.29		11.89	9.56
1961-62				14.79

* Synthesized Data

** For station name, refer to List of Tables

May 1964

TABLE 7-2

LONG-TERM ANNUAL PRECIPITATION IN INCHES

Double-Mass Adjusted

WATER	STATION INDEX NUMBER *									
YEAR	012100	031901	056400	074000	386400	468600	512455	526800	580300	810700
1914-15	57.99				33.08			22.67		
1915-16	47.28			47.30	27.36	61.03	39.84	16.46	45.89	24.97
1916-17	35.76			35.67	19.19	47.47	30.39	12.16	36.86	19.49
1917-18	18.51	7.76		18.70	11.76	25.12	16.00	8.83	19.20	8.89
1918-19	39.91	19.34		40.66	28.83	51.79	35.61	17.55	41.34	24.31
1919-20	27.04	10.64	11.63	24.44	13.91	34.81	22.29	8.64	26.02	11.89
1920-21	43.88	14.26	22.90	39.87	25.17	57.78	33.41	14.34	39.13	20.07
1921-22	41.03	15.44	18.17	42.09	22.66	52.15	34.57	13.67	37.18	21.88
1922-23	45.94	13.00	18.13	36.44	21.45	53.87	34.76	14.19	37.87	19.51
1923-24	16.09	6.09	8.73	13.60	10.43	19.80	12.95	6.24	13.49	7.01
1924-25	37.87	14.41	21.83	33.09	26.88	49.76	28.97	14.12	32.11	16.85
1925-26	44.76	9.63	16.54	40.47	17.25	49.40	37.51	13.55	41.39	24.10
1926-27	45.52	13.96	23.04	40.62	25.59	49.13	35.97	14.11	40.79	21.51
1927-28	36.00	13.37	16.59	31.98	17.34	40.74	27.56	9.95	31.39	15.00
1928-29	24.16	10.44	11.33	20.01	15.31	26.63	17.70	9.88	21.55	11.11
1929-30	37.13	12.12	14.52	32.14	16.57	39.34	27.68	10.88	34.09	16.30
1930-31	18.75	8.45	10.30	18.59	15.67	21.68	14.07	8.39	15.81	10.31
1931-32	38.96	12.39	21.68	37.34	23.08	46.56	32.06	13.48	38.18	21.41
1932-33	23.91	9.04	13.61	26.52	15.71	30.22	18.77	9.16	24.58	12.50
1933-34	30.72	8.87	11.84	34.29	15.05	40.40	25.26	9.25	33.28	17.24
1934-35	40.66	14.98	20.91	37.95	25.27	50.80	34.28	16.15	37.79	20.69
1935-36	37.91	14.42	16.80	33.35	23.13	45.90	30.58	12.47	35.88	15.28
1936-37	42.63	16.11	21.06	43.81	24.44	52.42	34.66	17.48	38.87	21.20
1937-38	64.75	20.02	26.99	55.09	29.43	76.31	51.35	19.44	61.95	32.46
1938-39	22.85	10.87	11.89	18.88	14.83	26.07	15.10	10.90	19.42	11.39
1939-40	51.91	16.27	24.09	42.87	28.48	55.96	38.95	16.95	43.48	23.07
1940-41	62.87	17.52	27.57	57.21	36.14	71.38	57.05	22.06	63.39	33.71
1941-42	54.66	18.35	24.07	47.04	31.35	52.01	42.24	16.08	42.34	22.89
1942-43	38.03	15.08	23.42	37.95	21.02	47.39	30.61	13.39	31.56	19.33
1943-44	32.84	12.33	15.10	28.46	17.05	38.28	24.92	11.54	29.33	15.58
1944-45	38.09	13.34	19.04	34.46	21.70	46.24	28.86	12.41	34.48	19.63
1945-46	37.96	11.71	17.50	34.43	18.16	46.73	28.98	10.76	34.07	17.86
1946-47	25.22	9.54	12.57	23.26	14.19	31.38	20.83	9.08	21.82	12.22
1947-48	30.93	11.28	13.34	27.27	17.63	39.03	22.66	9.46	27.18	12.96
1948-49	34.33	9.71	13.43	33.39	16.82	41.56	25.10	11.36	31.78	16.78
1949-50	28.10	9.24	13.70	27.34	20.40	36.98	23.65	8.46	25.90	13.56
1950-51	46.73	17.32	22.47	38.96	24.00	63.98	34.56	13.50	36.90	20.30
1951-52	59.35	19.80	26.58	52.50	31.15	68.36	46.11	20.70	54.51	30.42
1952-53	35.50	11.75	20.07	31.47	20.97	42.00	25.83	9.94	32.71	17.01
1953-54	32.47	10.71	13.57	26.82	17.41	39.61	24.67	12.19	29.72	15.04
1954-55	31.29	11.68	15.02	28.57	16.74	36.83	25.26	13.84	31.27	16.13
1955-56	56.16	18.88	25.90	56.80	28.91	68.24	46.66	20.70	56.86	29.26
1956-57	27.29	12.17	13.77	23.89	17.38	34.68	21.56	10.60	21.45	14.02
1957-58	59.31	21.67	30.87	56.89	37.08	70.58	45.53	22.82	49.77	32.56
1958-59	28.67	7.39	9.24	23.56	11.11	34.55	22.41	9.31	23.45	16.67
1959-60	27.01	9.56	16.00	23.72	17.59	33.88	22.36		23.34	13.28
1960-61	23.26	11.47	11.13		14.79					

* For station name, refer to List of Tables

LIST OF FIGURES

Figure

PRECIPITATION-ELEVATION RELATIONSHIP

2 - 1 Diablo Mountain Range
2 - 2 Santa Cruz Mountain Range (East Slope)

2 - 3 MAP OF MEAN ANNUAL PRECIPITATION

3 - 1 PRECIPITATION-RUNOFF CORRELATIONS

3 - 2 MAP OF MEAN ANNUAL RUNOFF

PRECIPITATION PROBABILITY

4 - 1 Calaveras Reservoir 128100
4 - 2 Gilroy Wentz Composite 342560, 342571
4 - 3 Los Gatos Composite 512260, 512280, 512290, 512300
4 - 4 Mount Hamilton 593300
4 - 5 Palo Alto Composite 664201, 664202, 664600
4 - 6 San Jose 782100
4 - 7 Wrights Composite 981300, 981400
4 - 8 Shanti Ashrama 813000

4 - 9 Regional Means

PRECIPITATION, INTENSITY-DURATION-FREQUENCY

5 - 1 Palo Alto 1911 - 1961
5 - 2 San Jose 1918 - 1961
5 - 3 Corralitos 1946 - 1961
5 - 4 Boulder Creek-Locatelli 1944 - 1961
5 - 5 Highland - Freedom 1943 - 1961
5 - 6 Morgan Hill Bossana Ranch 1945 - 1961
5 - 7 Mount Madonna 1946 - 1961
5 - 8 San Felipe Highway Station 1943 - 1961
5 - 9 Gilroy 8 NE 1945 - 1961

5 - 10 "K" and "n" Values for $i = Kt^{-n}$

5 - 11 San Jose September
5 - 12 San Jose October
5 - 13 San Jose November
5 - 14 San Jose December
5 - 15 San Jose January
5 - 16 San Jose February
5 - 17 San Jose March
5 - 18 San Jose April
5 - 19 San Jose May
5 - 20 San Jose June

LIST OF FIGURES
(Continued)

Figure

PEAK STREAMFLOW FREQUENCY CURVES

6 - 1 Arroyo Seco near Soledad 152000
6 - 2 Pacheco Creek near Dunneville 153000
6 - 3 Llagas Creek near Morgan Hill 153500
6 - 4 Uvas Creek near Morgan Hill 154000
6 - 5 Pajaro River near Chittenden 159000
6 - 6 San Lorenzo River at Big Trees 160500
6 - 7 San Francisquito Creek 164500
6 - 8 Stevens Creek 166500
6 - 9 Permanente Creek 166580
6 - 10 Hale (Magdalena) Creek 166610
6 - 11 Alamitos Creek 167000
6 - 12 Guadalupe Creek 167500
6 - 13 Ross Creek 167640
6 - 14 Los Gatos Creek 168000
6 - 15 San Tomas Creek 169070
6 - 16 Saratoga Creek at Saratoga 169500
6 - 17 Penitencia Creek near San Jose 172120
6 - 18 Alameda Creek 173000
6 - 19 Arroyo Mocho Creek 176000
6 - 20 Arroyo Valle Creek 176500

6 - 21 Berryessa Creek at S. P. R. R.
6 - 22 Canoas Creek near San Jose
6 - 23 Coyote Creek at Coyote Dam
6 - 24 Las Animas Creek above Anderson Dam
6 - 25 Silver Creek near San Jose
6 - 26 Wildcat Creek at Saratoga - Los Gatos Road

6 - 27 Regional Means

6 - 28 REGIONAL FLOOD FREQUENCY RELATIONS, UNGAGED WATERSHEDS

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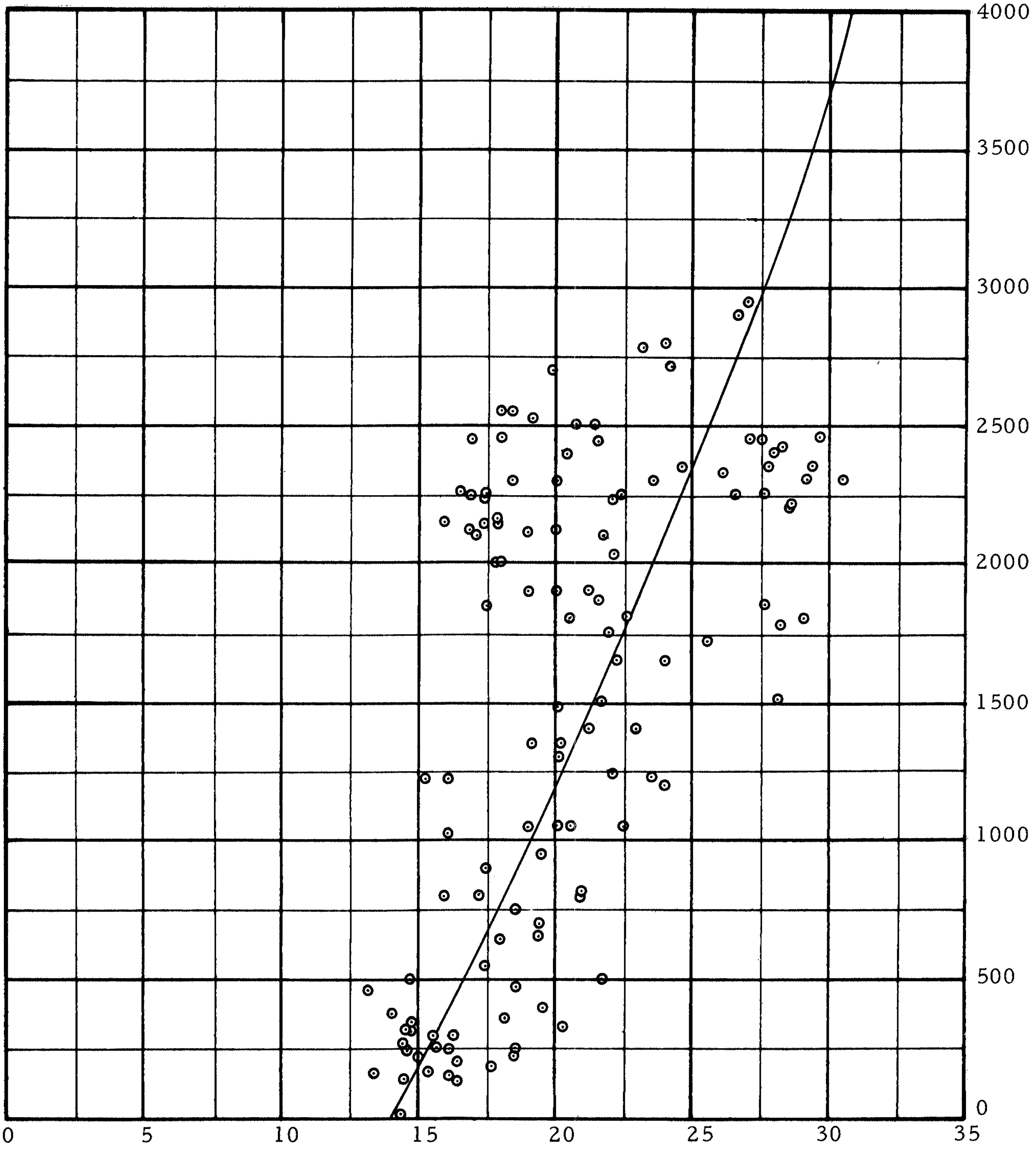
FIGURE 2-1

PRECIPITATION-ELEVATION RELATIONSHIP
Diablo Mountain Range



MEAN ANNUAL PRECIPITATION IN INCHES
(July 1 through June 30)

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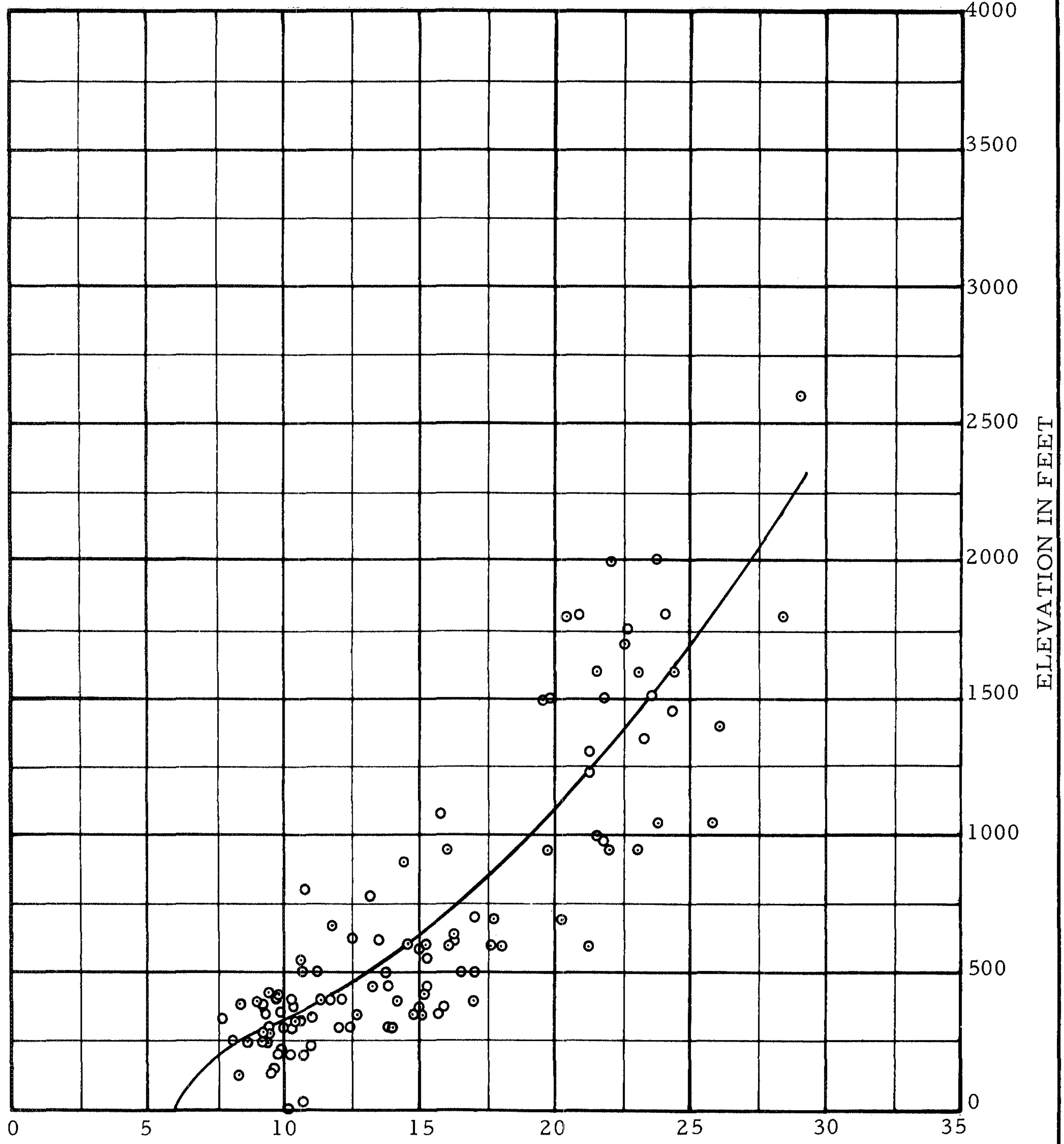
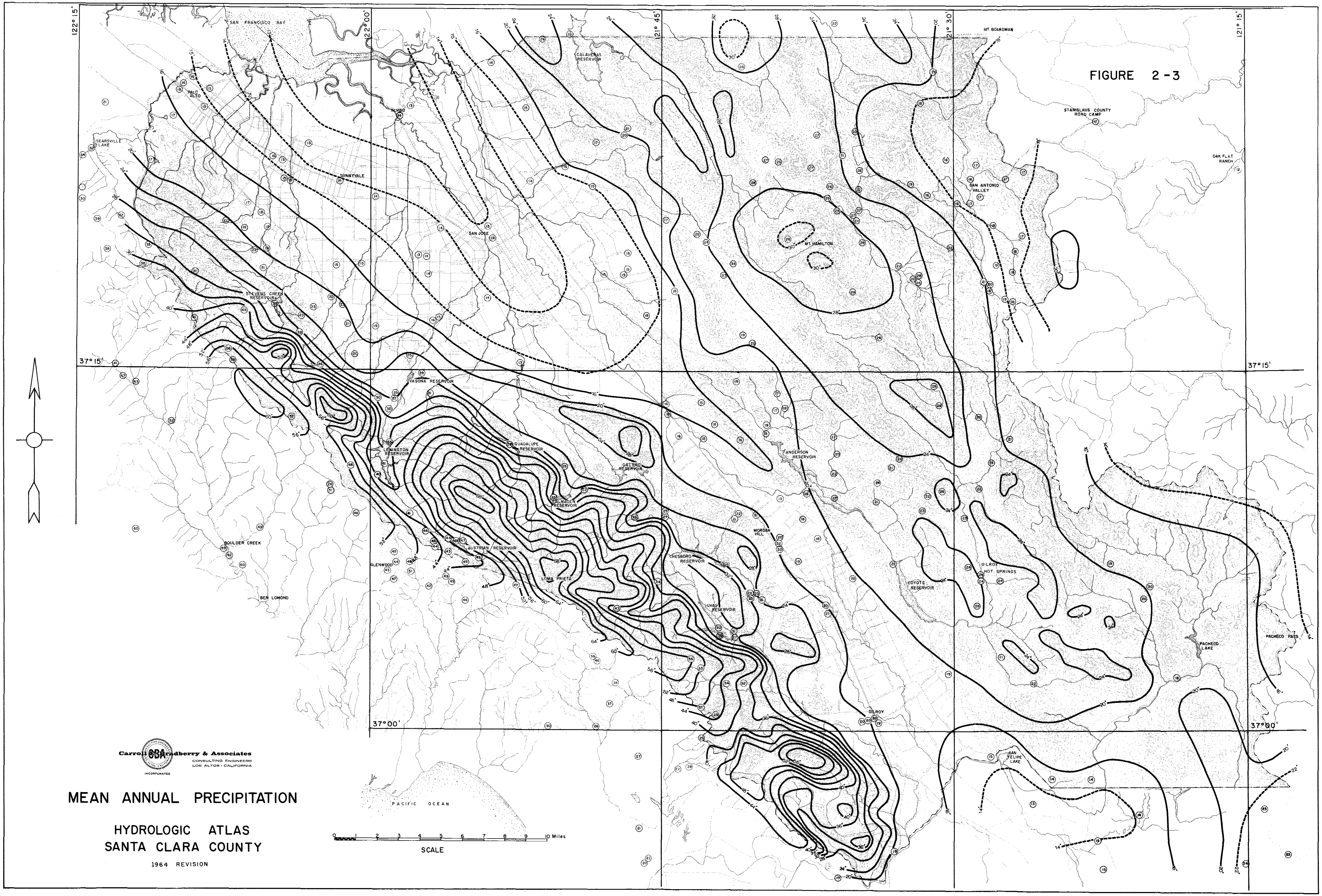
FIGURE 2-2

PRECIPITATION-ELEVATION RELATIONSHIP
Santa Cruz Mountain Range (East Slope)



MEAN ANNUAL PRECIPITATION IN INCHES
(July 1 through June 30)

FIGURE 2-3



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MEAN ANNUAL PRECIPITATION

HYDROLOGIC ATLAS
SANTA CLARA COUNTY

1964 REVISION

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FIGURE 3-1

PRECIPITATION-RUNOFF CORRELATIONS
Mean Annual

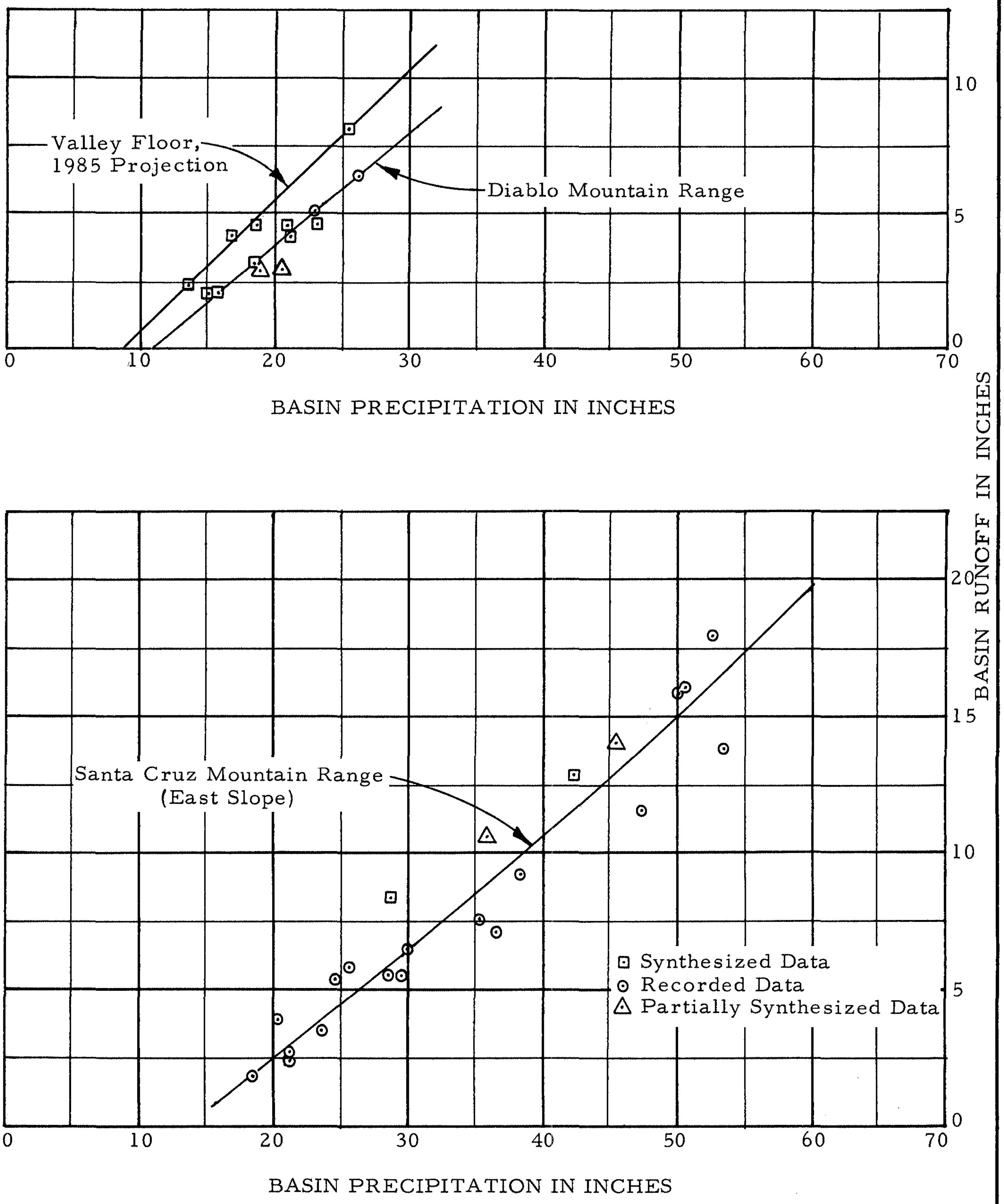
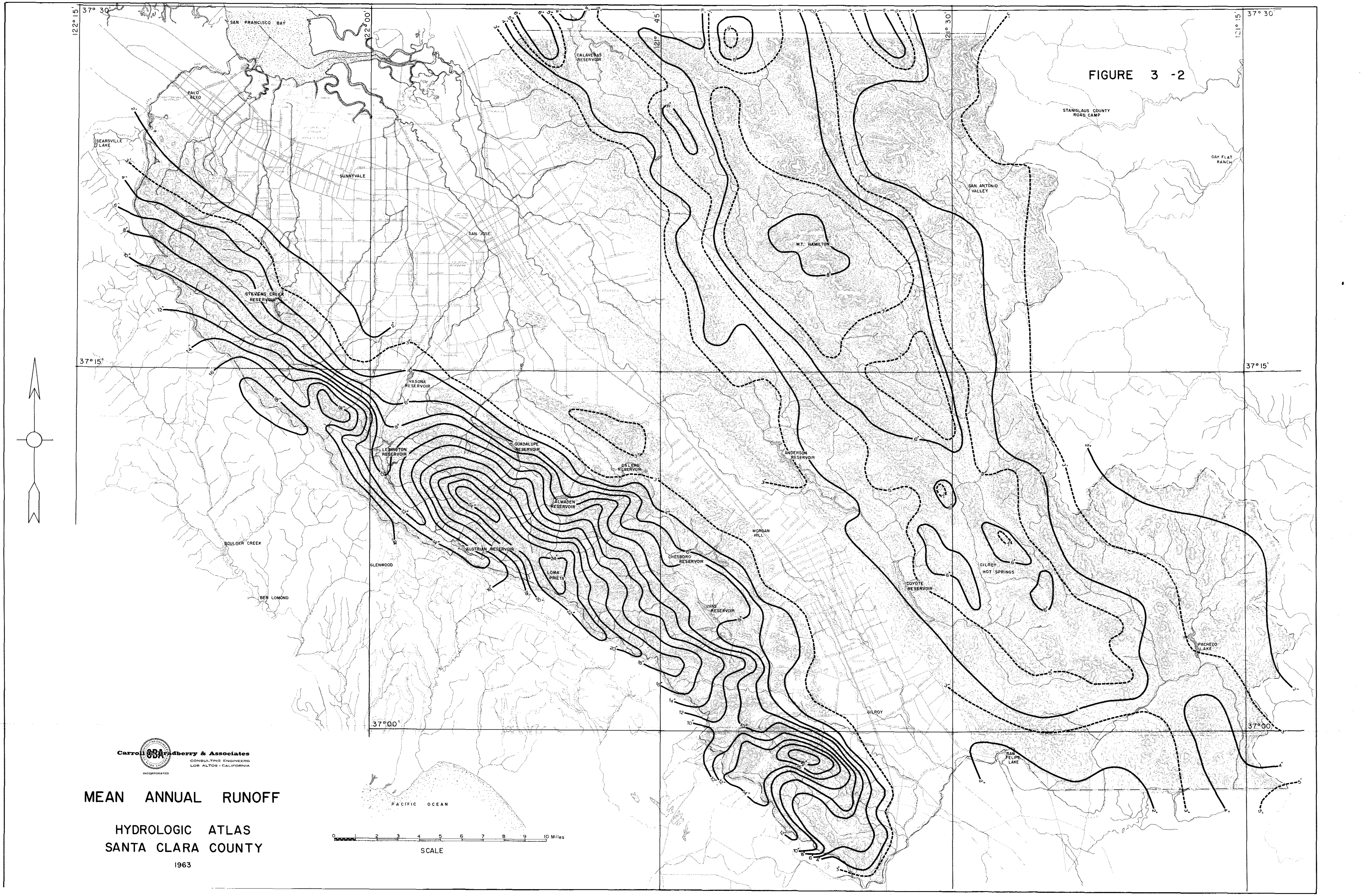


FIGURE 3 -2



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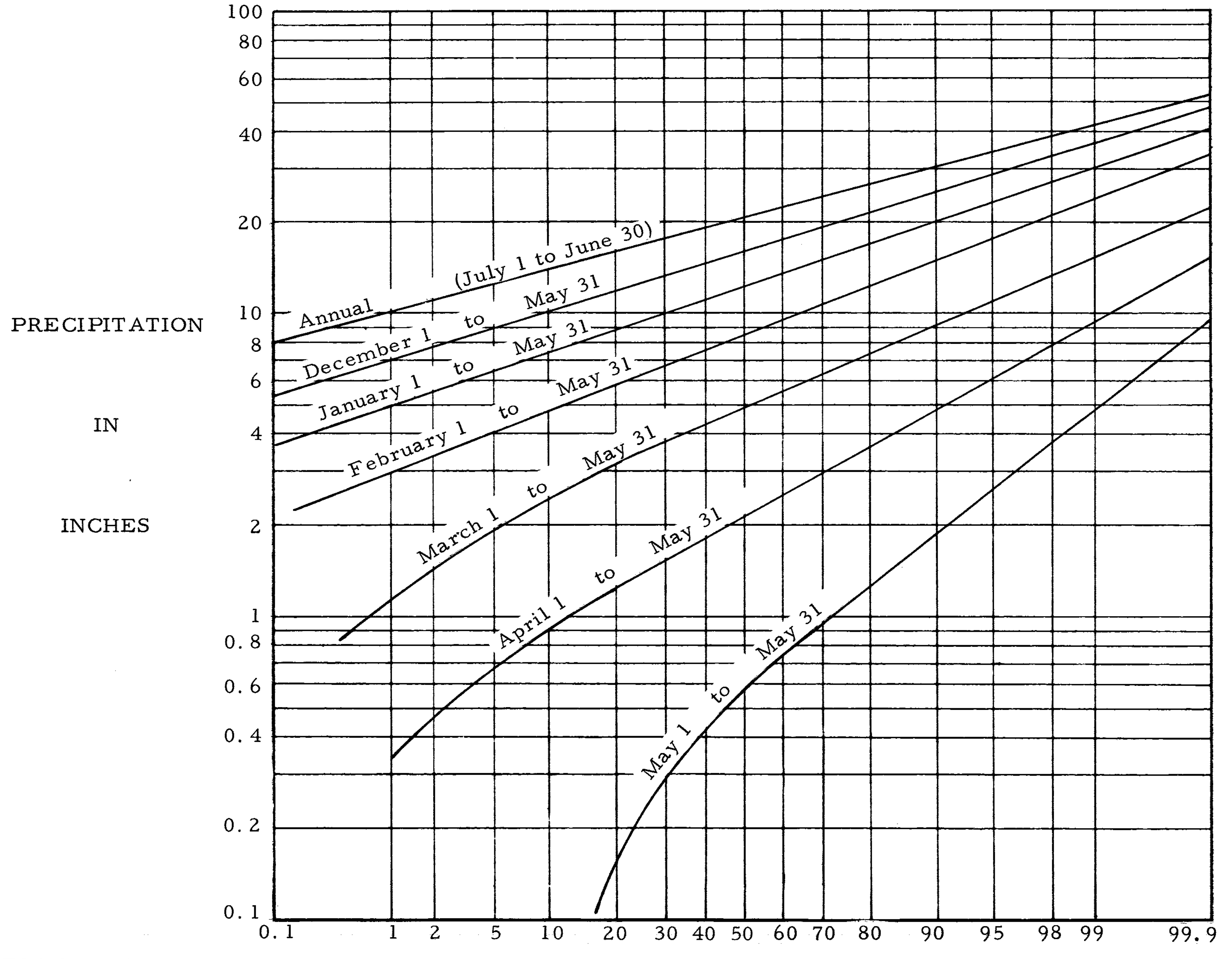
MEAN ANNUAL RUNOFF

HYDROLOGIC ATLAS
SANTA CLARA COUNTY
1963



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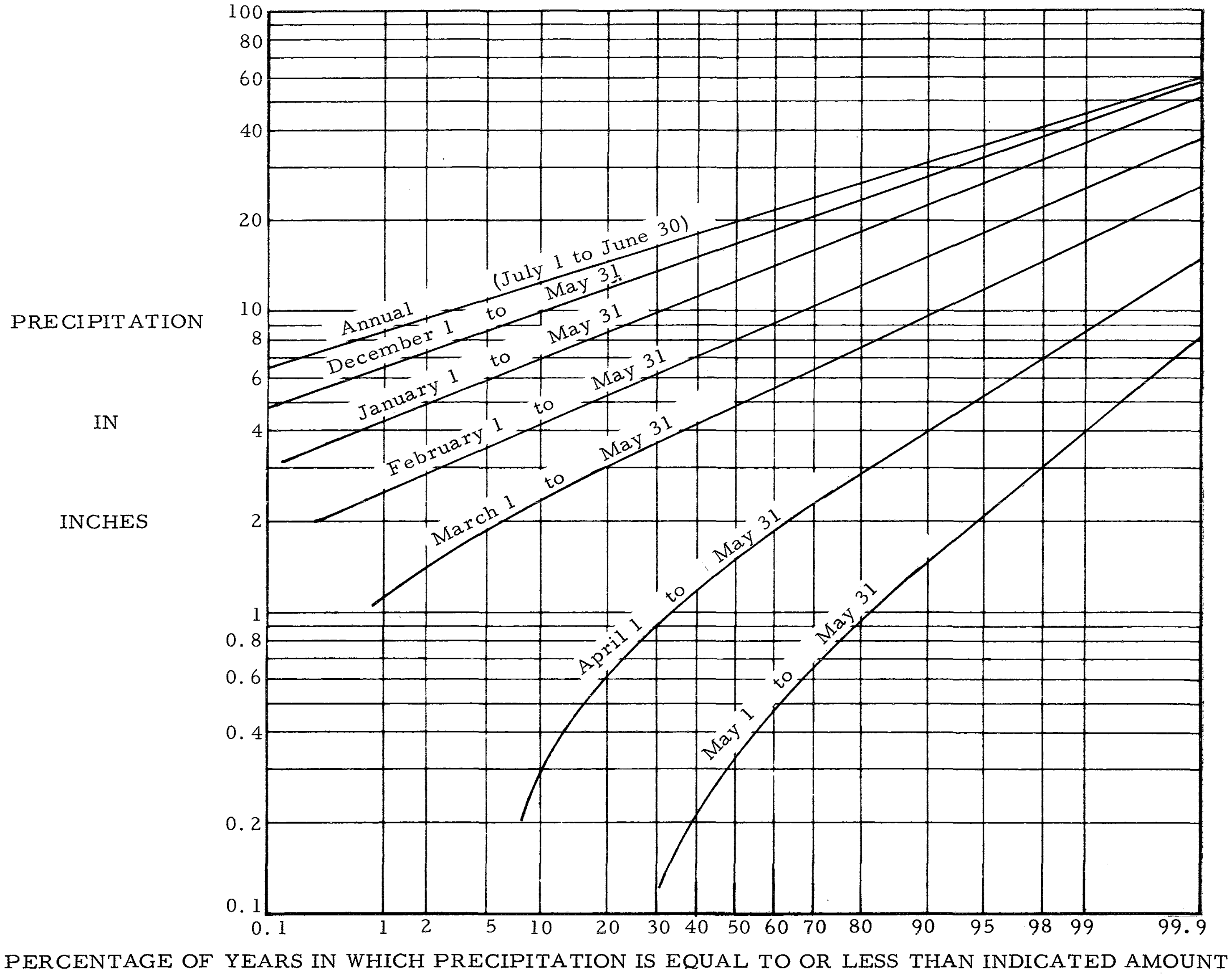
May 1964

PRECIPITATION PROBABILITY
Calaveras Reservoir
128100

FIGURE 4-1



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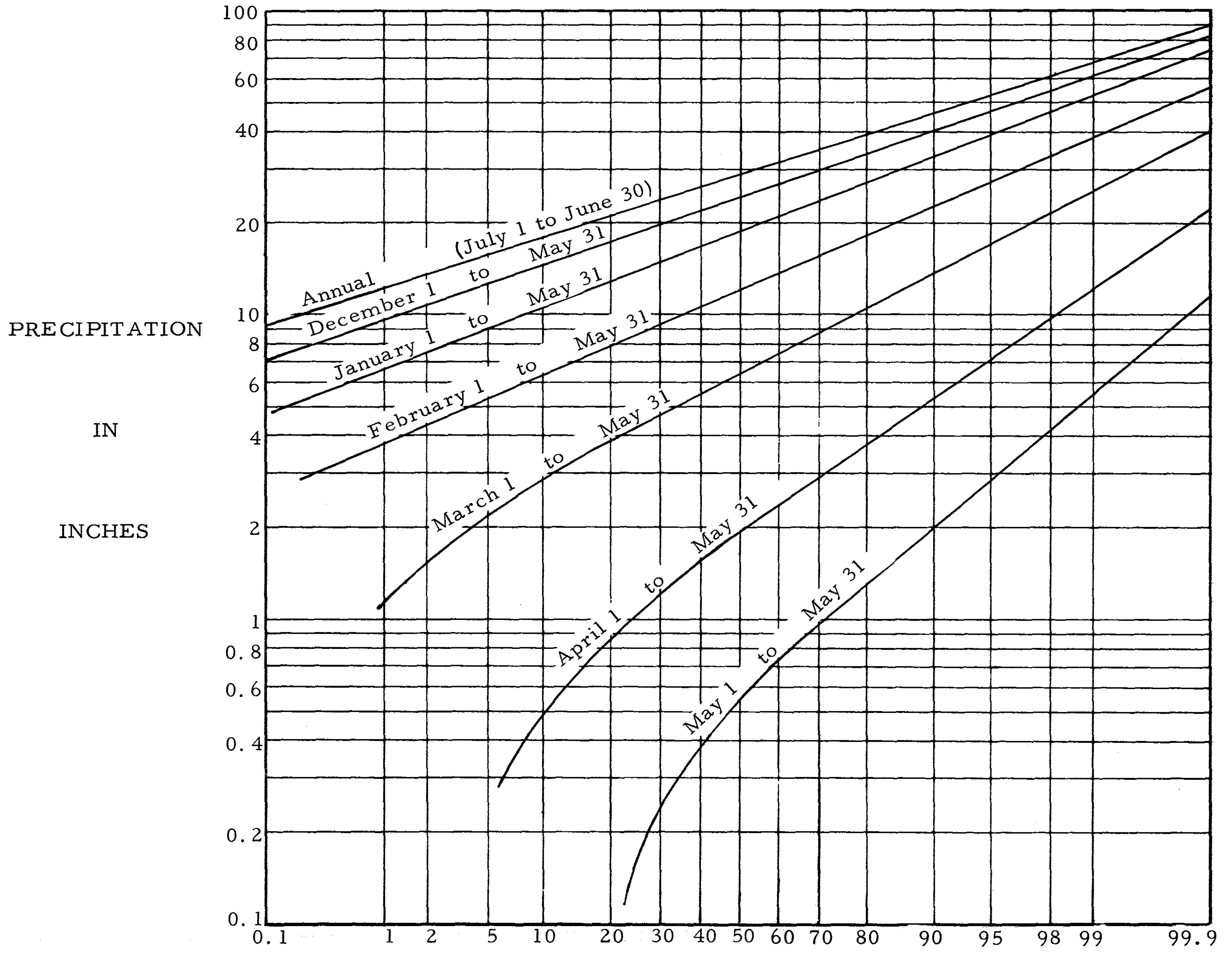
PRECIPITATION PROBABILITY
Gilroy Wentz Composite
342560, 342571

May 1964

FIGURE 4-2



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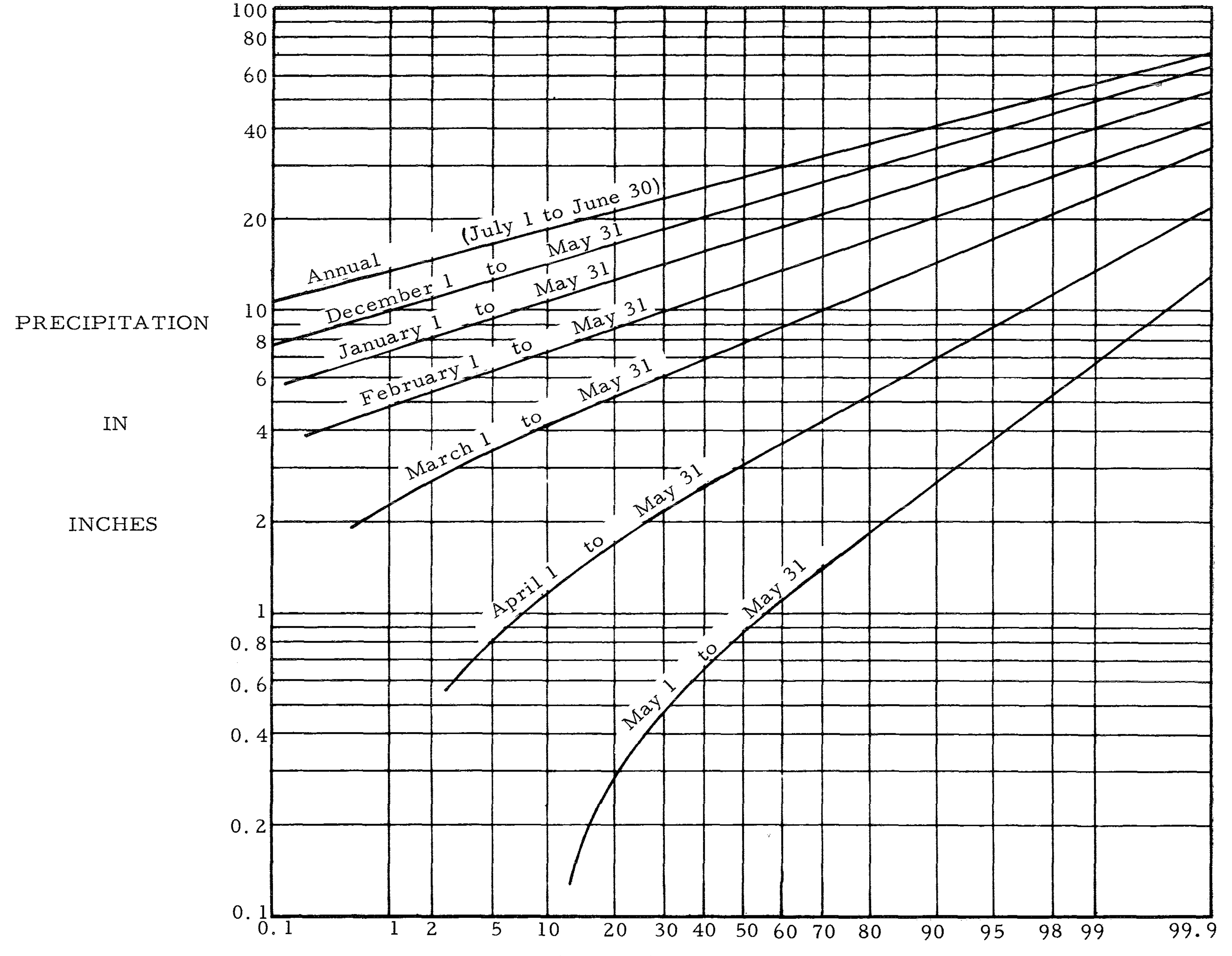
PRECIPITATION PROBABILITY
Los Gatos Composite
512260, 512280, 512290, 512300

FIGURE 4-3



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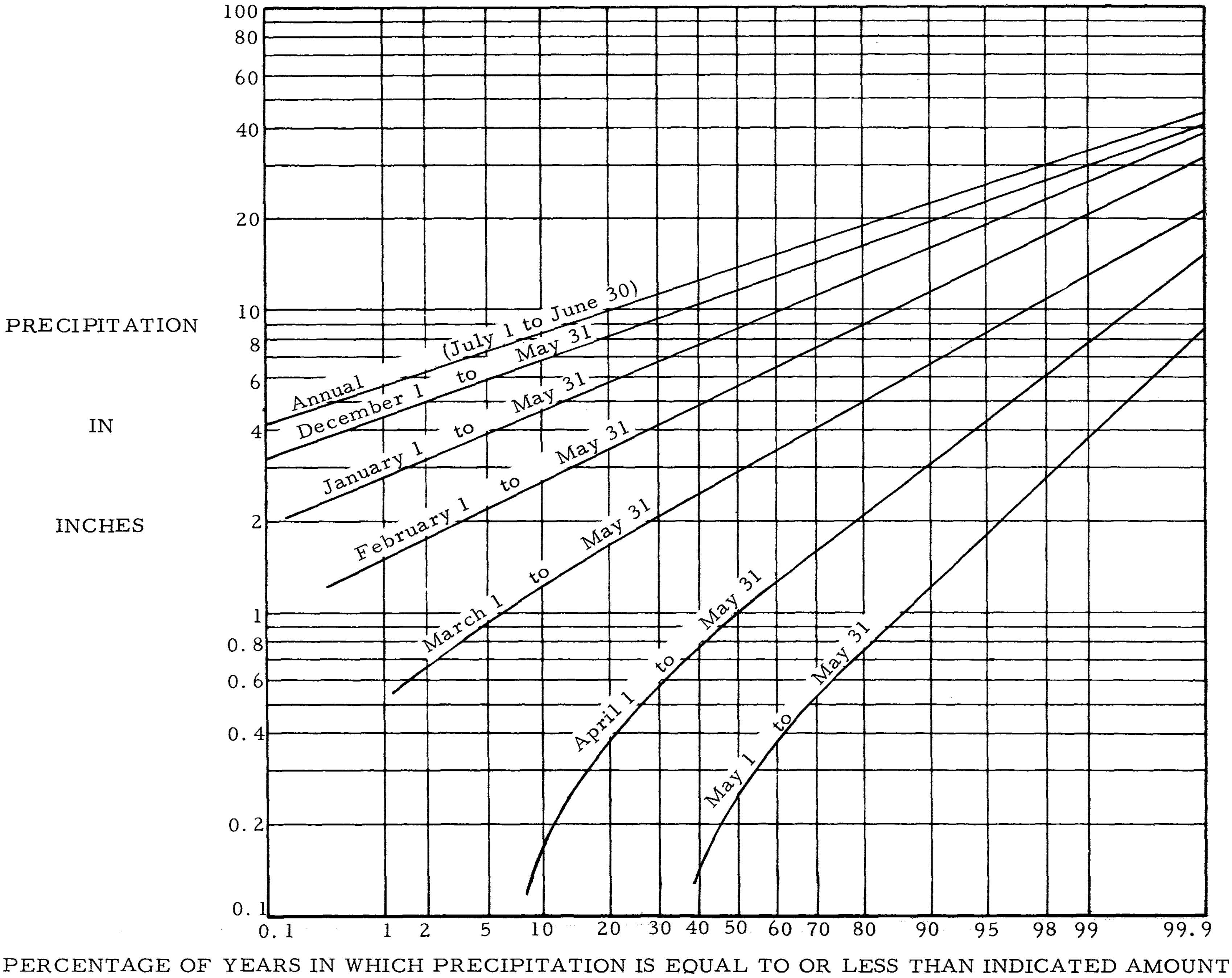
PRECIPITATION PROBABILITY
Mount Hamilton
593300

FIGURE 4-4



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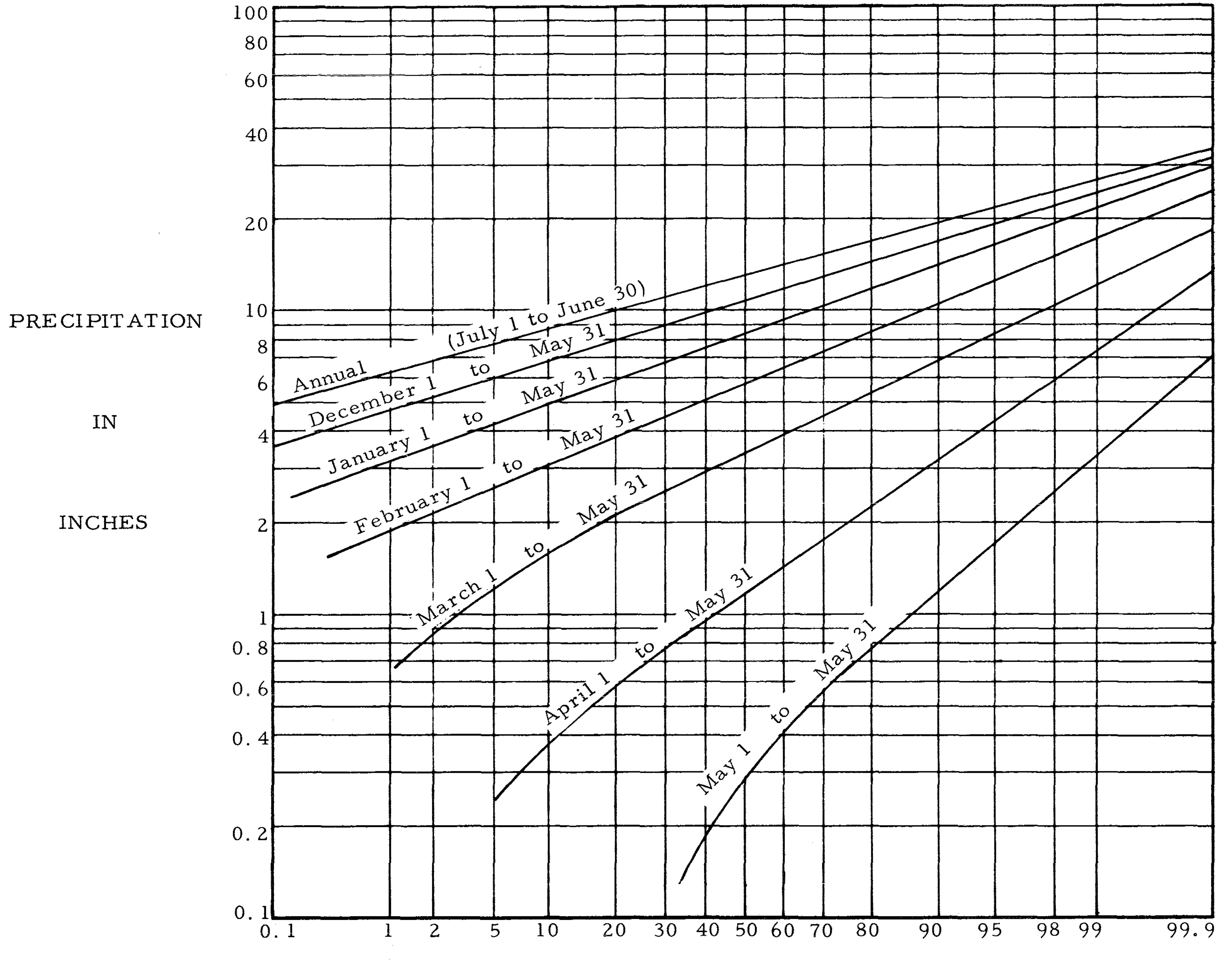
PRECIPITATION PROBABILITY
Palo Alto Composite
664201, 664202, 664600

FIGURE 4-5



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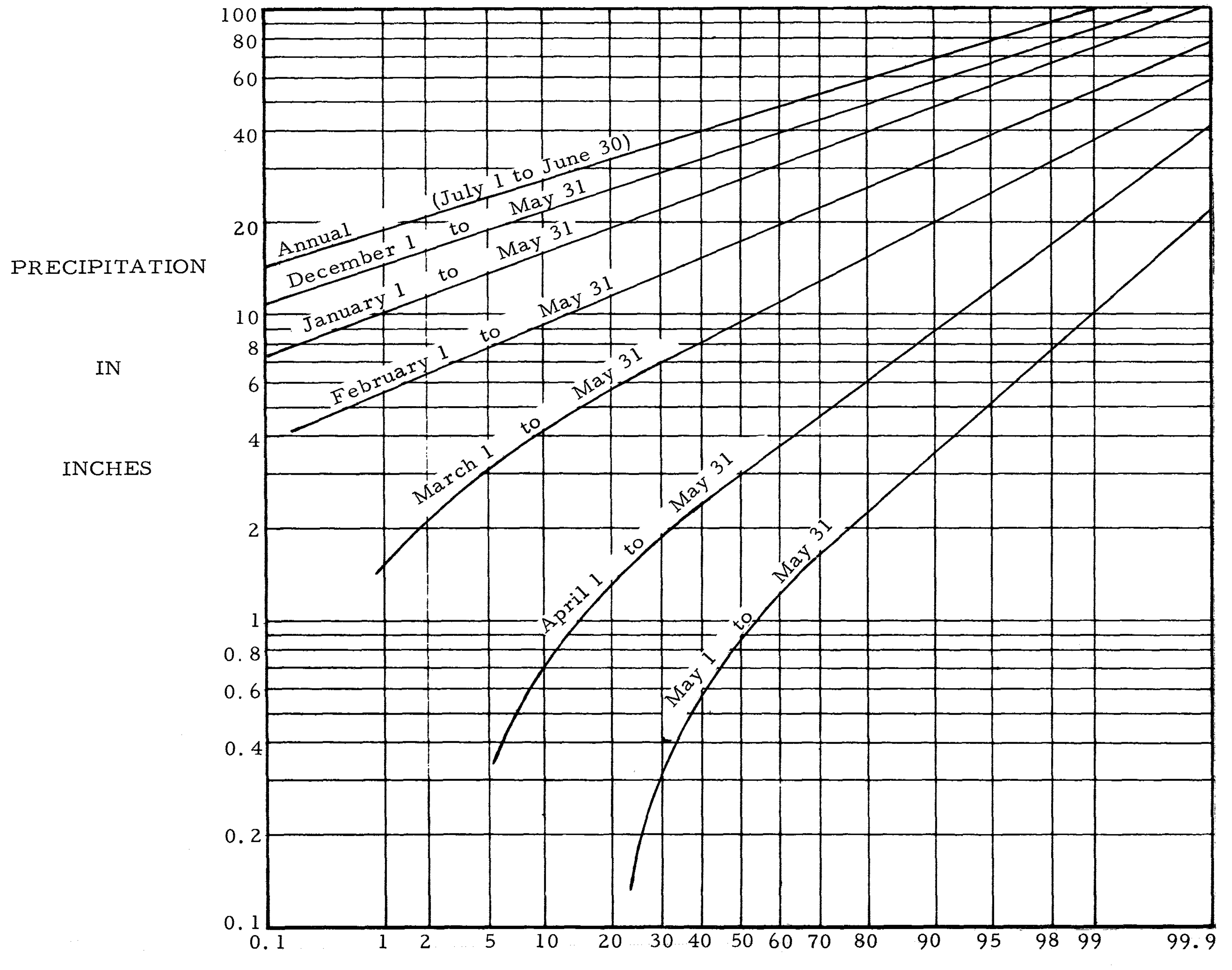
May 1964

PRECIPITATION PROBABILITY
San Jose
782100

FIGURE 4-6



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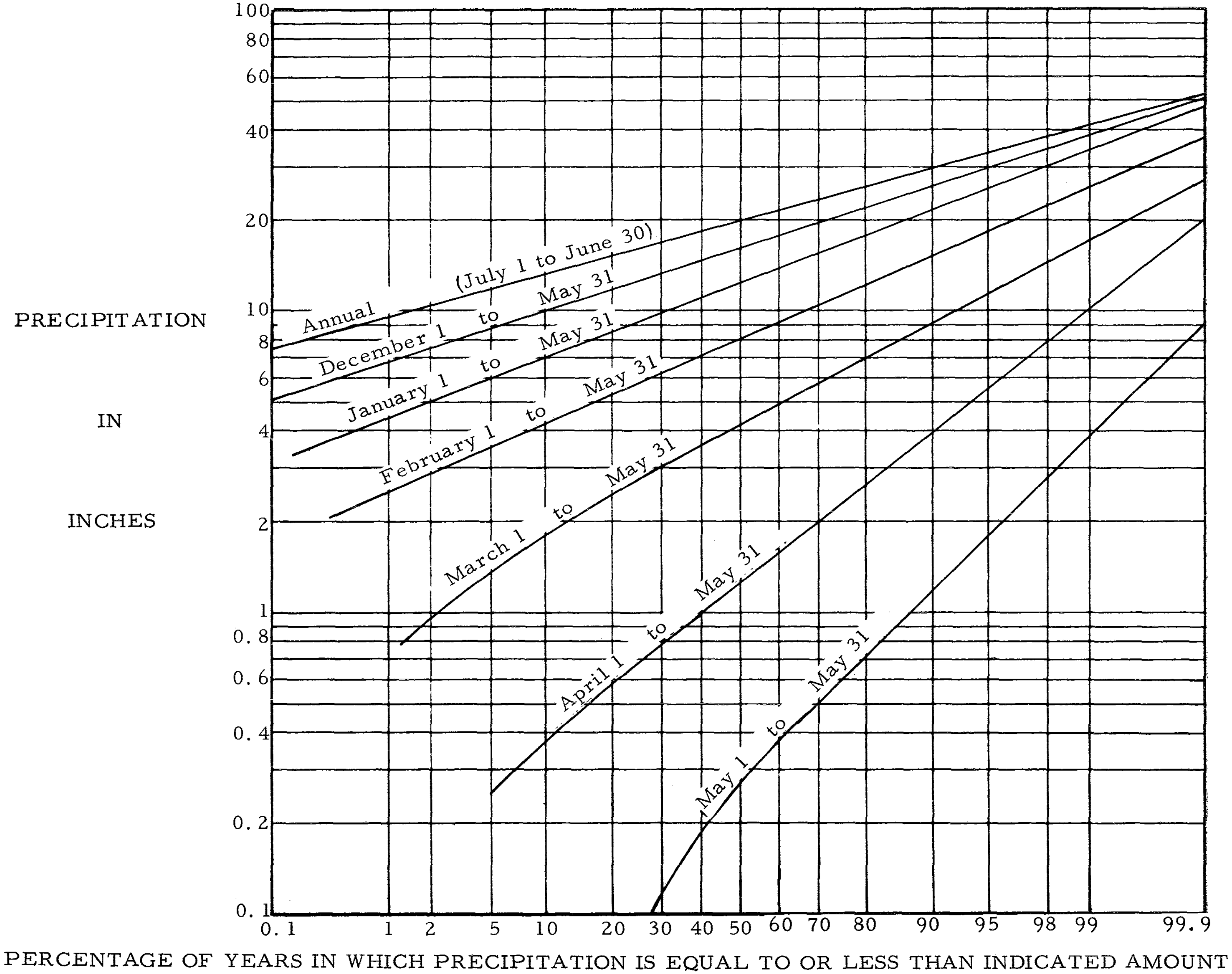
PRECIPITATION PROBABILITY
Wrights Composite
981300, 981400

May 1964

FIGURE 4-7



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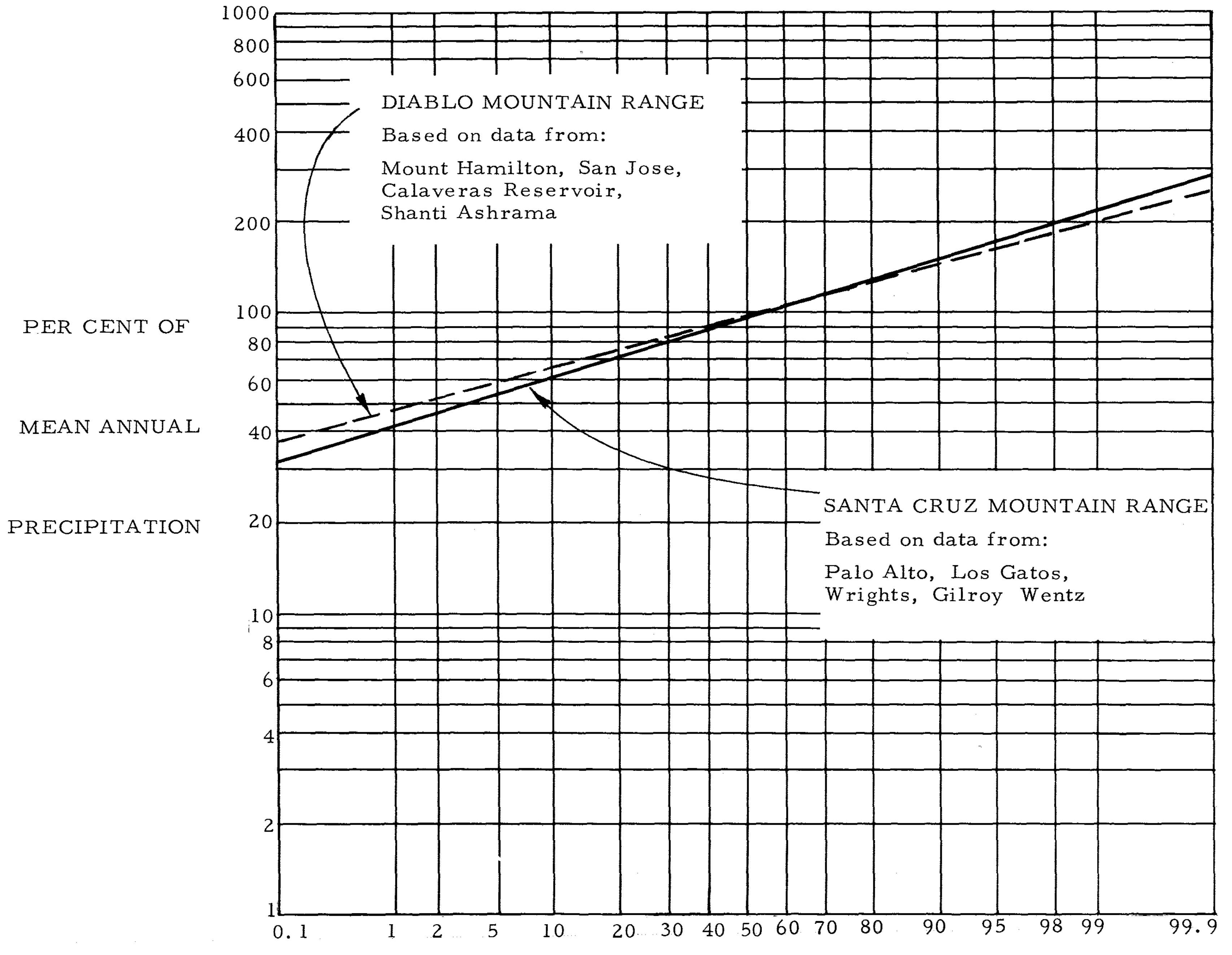
PRECIPITATION PROBABILITY
Shanti Ashrama
813000

FIGURE 4-8



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PRECIPITATION PROBABILITY
Regional Means

FIGURE 4-9

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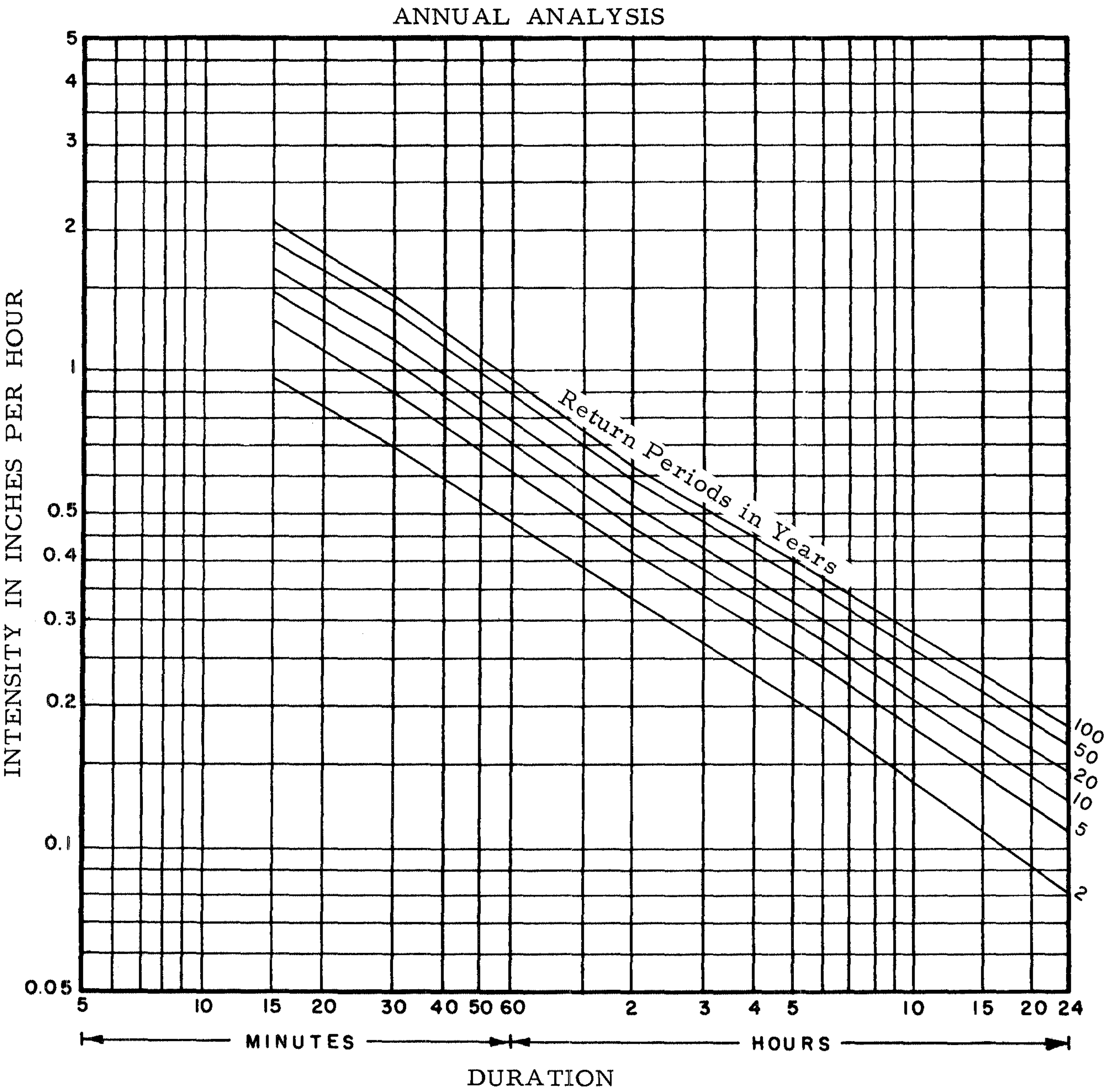
FIGURE 5-1

PRECIPITATION
Intensity - Duration - Frequency
Palo Alto 1911-1961



Adjusted Mean Annual Precipitation - 14.6 inches

Station Index No. 664600

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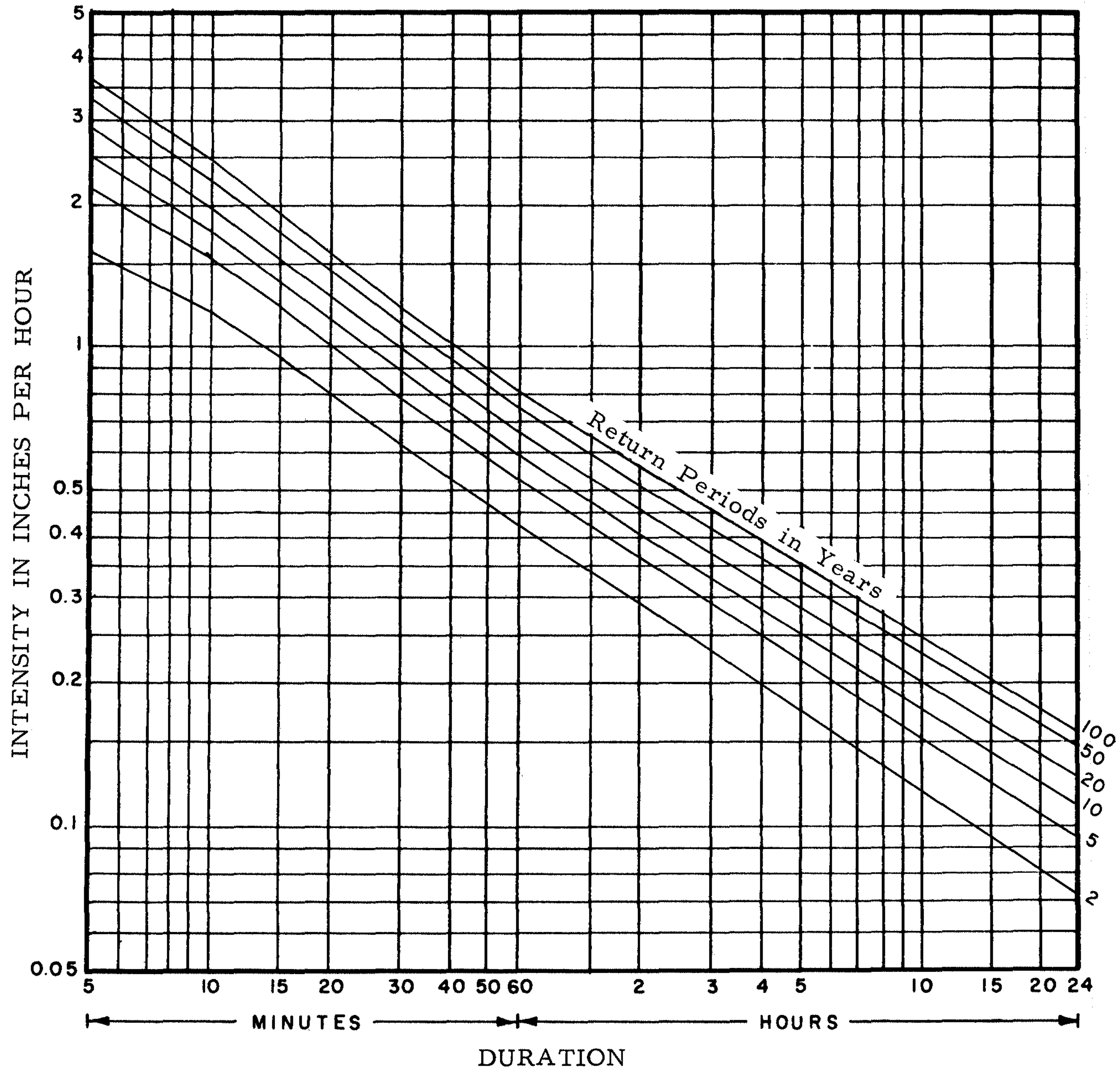
FIGURE 5-2

PRECIPITATION
Intensity - Duration - Frequency
San Jose 1918-1961

ANNUAL ANALYSIS



Adjusted Mean Annual Precipitation - 13.1 inches

Station Index No. 782100

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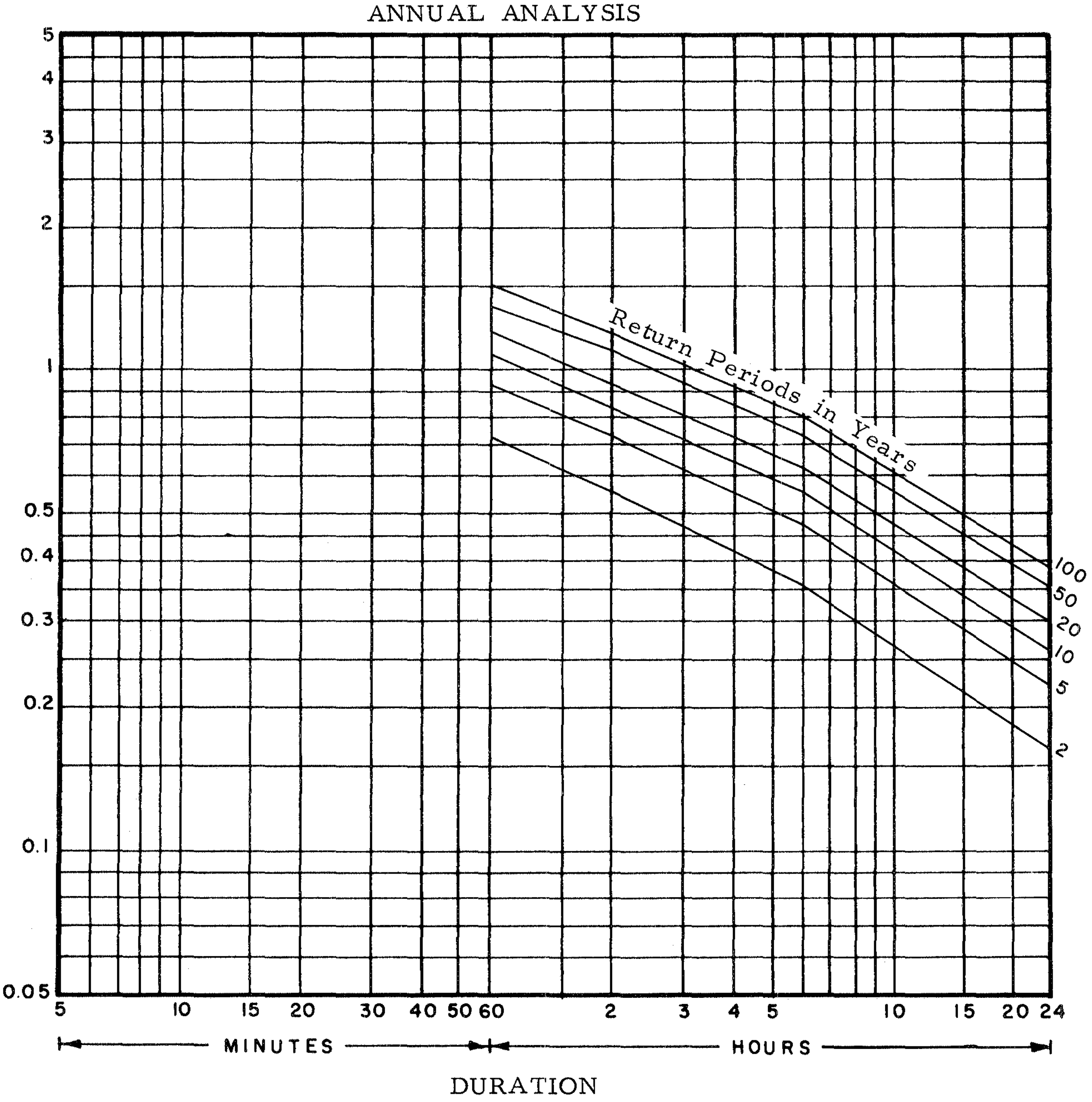
FIGURE 5-3

PRECIPITATION
Intensity - Duration - Frequency
Corralitos 1946-1961



Adjusted Mean Annual Precipitation - 26.3 inches

Station Index No. 204800

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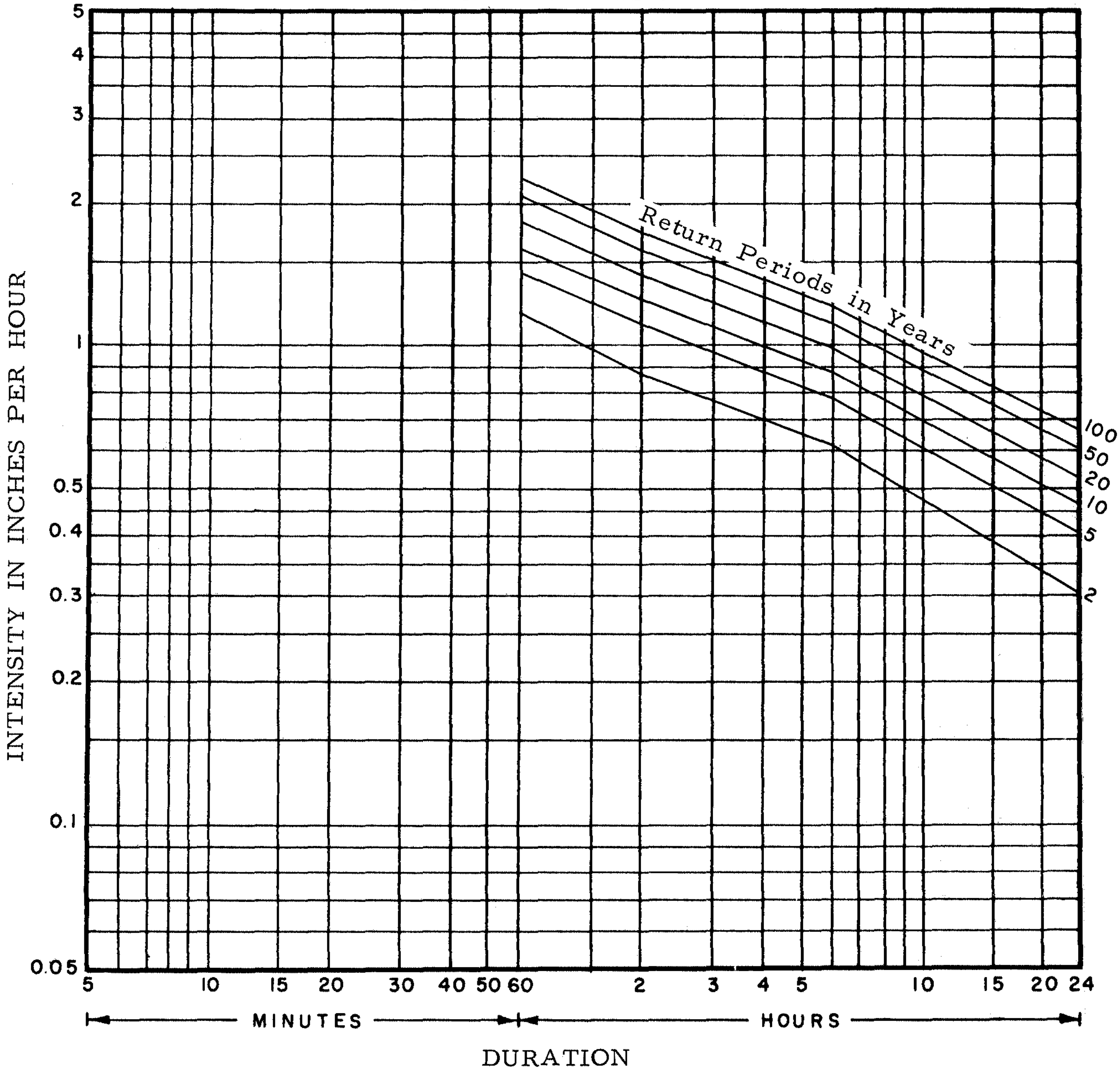
FIGURE 5-4

PRECIPITATION
Intensity - Duration - Frequency
Boulder Creek-Locatelli 1944-1961

ANNUAL ANALYSIS



Adjusted Mean Annual Precipitation - 60.3 inches

Station Index No. 100500

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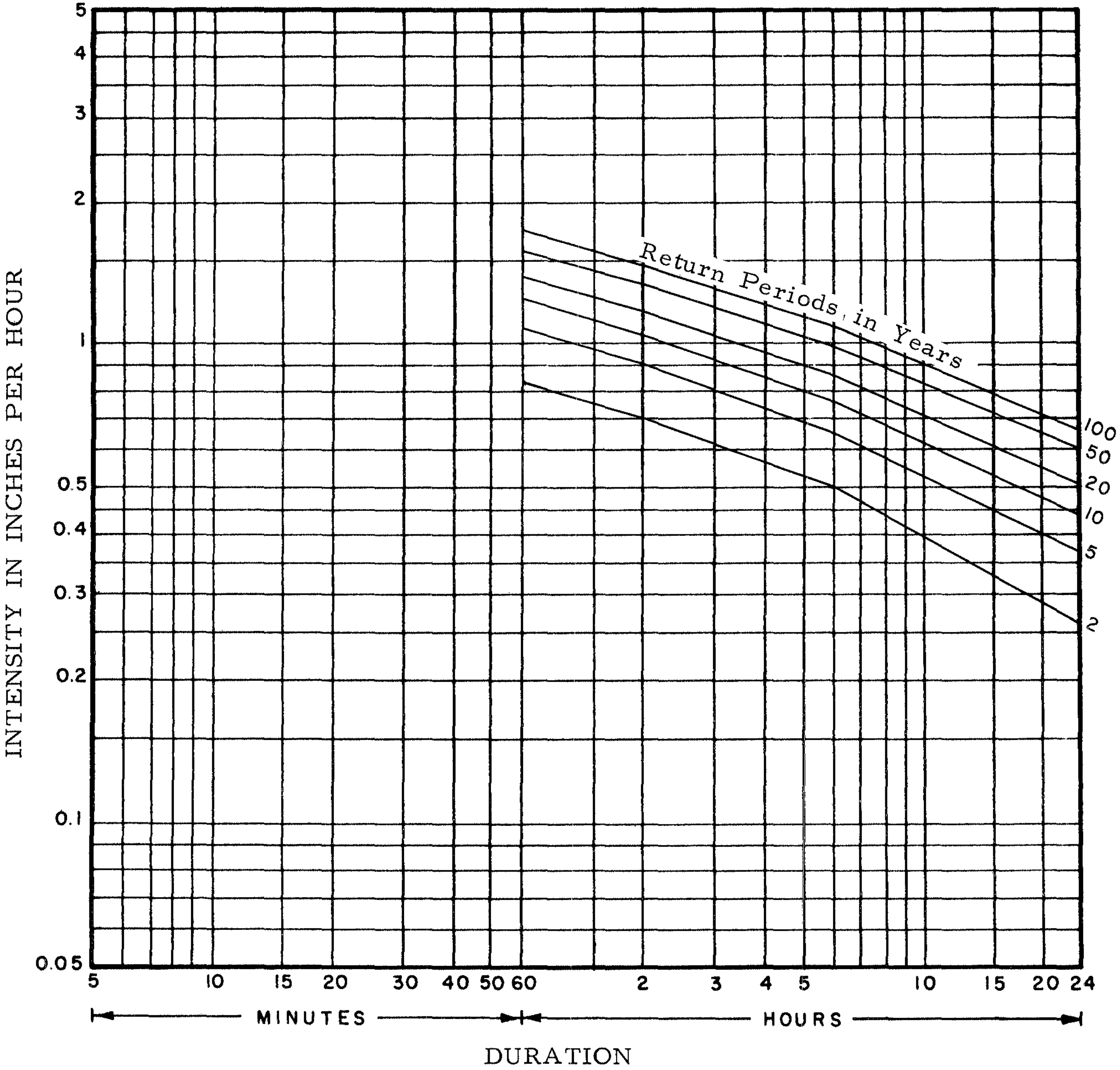
FIGURE 5-5

PRECIPITATION
Intensity - Duration - Frequency
Highland 1943-1952
Freedom 1952-1961

ANNUAL ANALYSIS



Adjusted Mean Annual Precipitation - 39. 5 inches

Station Index No. 323200

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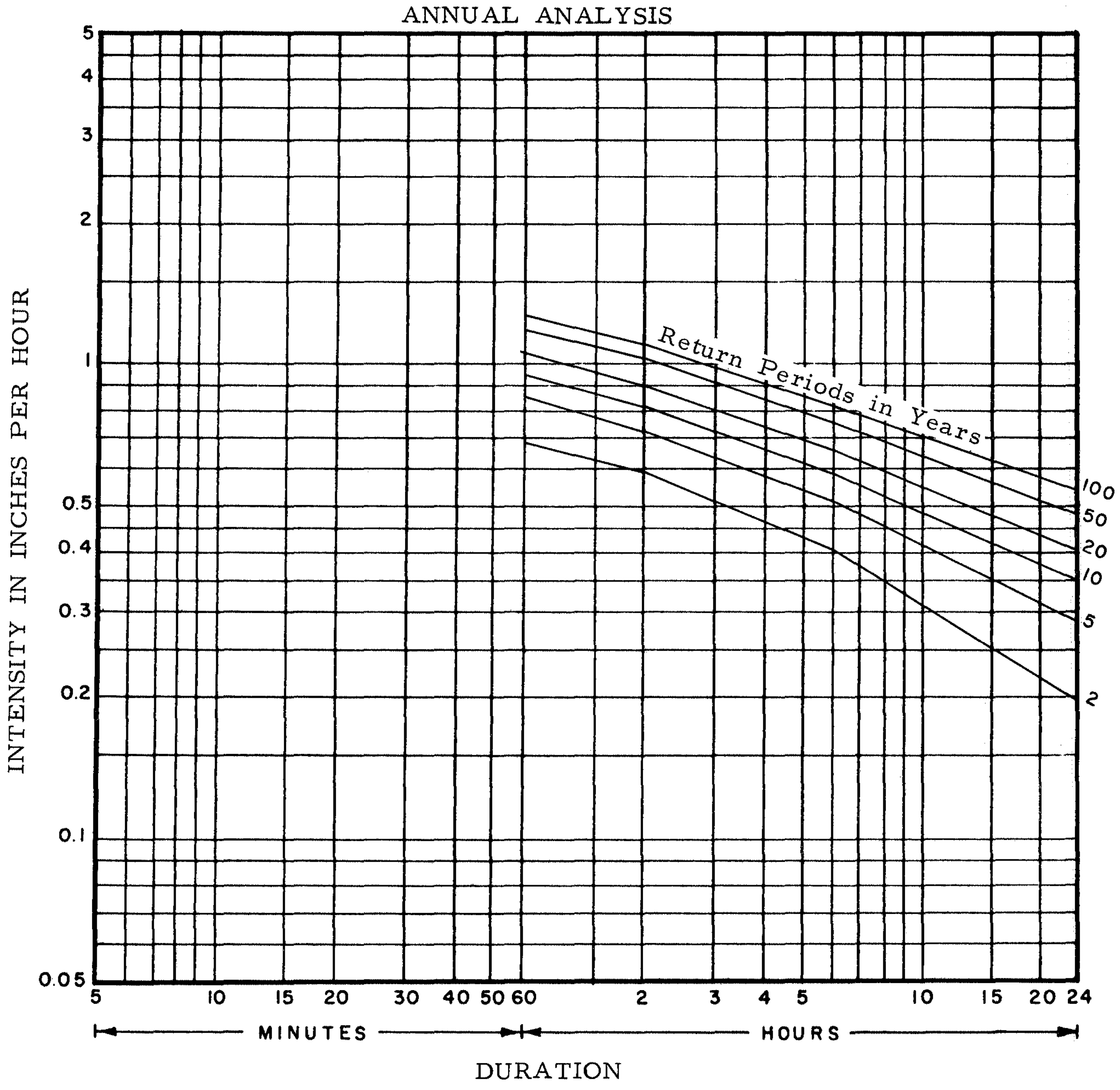
FIGURE 5-6

PRECIPITATION
Intensity - Duration - Frequency
Morgan Hill Bossana Ranch 1945-1961



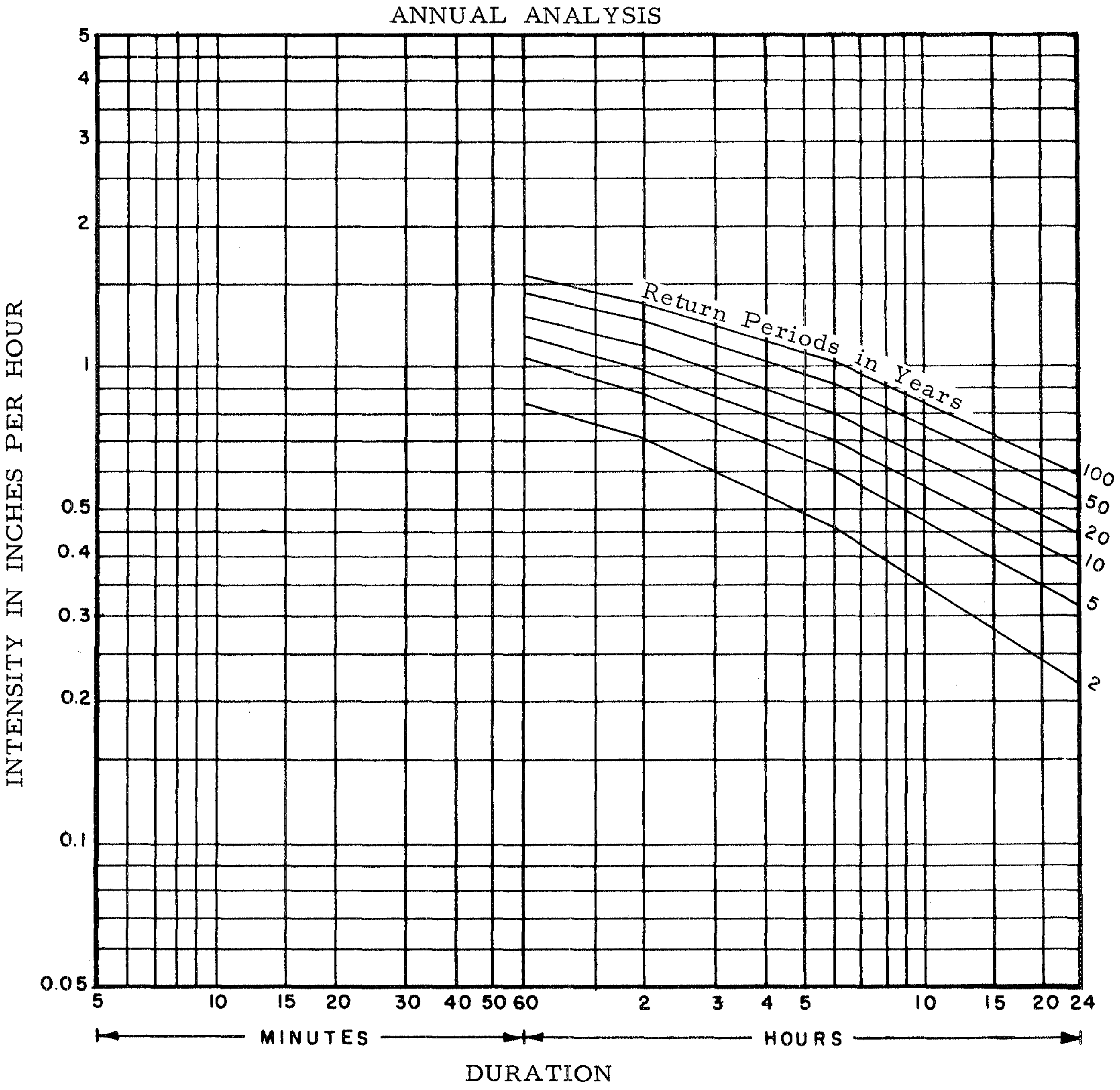
Adjusted Mean Annual Precipitation - 26.6 inches

Station Index No. 584700

May 1964

FIGURE 5-7

PRECIPITATION
Intensity - Duration - Frequency
Mount Madonna 1946-1961



Adjusted Mean Annual Precipitation - 37.1 inches

Station Index No. 597300

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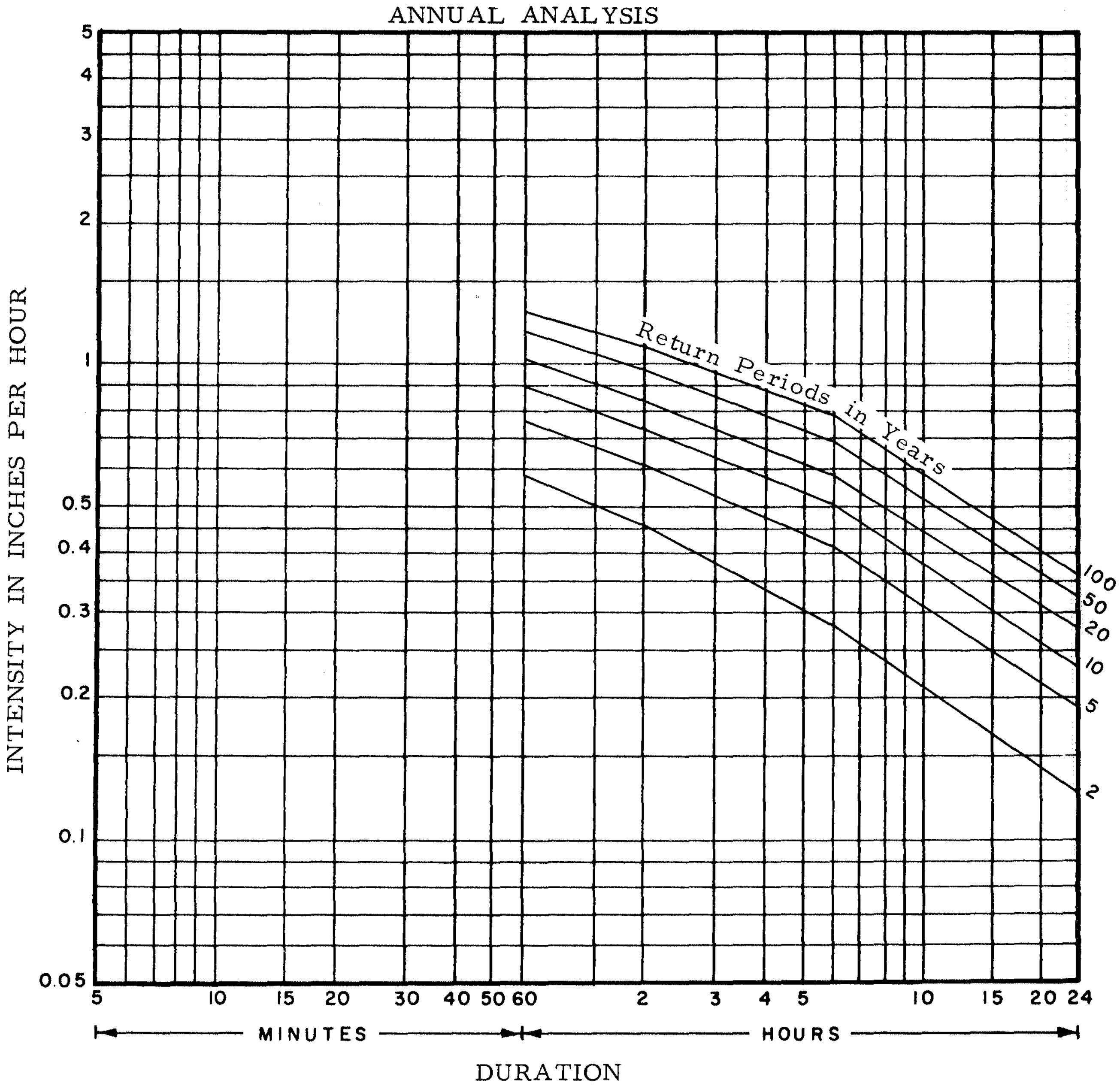
FIGURE 5-8

PRECIPITATION
Intensity - Duration - Frequency
San Felipe Highway Station 1943-1961



Adjusted Mean Annual Precipitation - 18.2 inches

Station Index No. 775500

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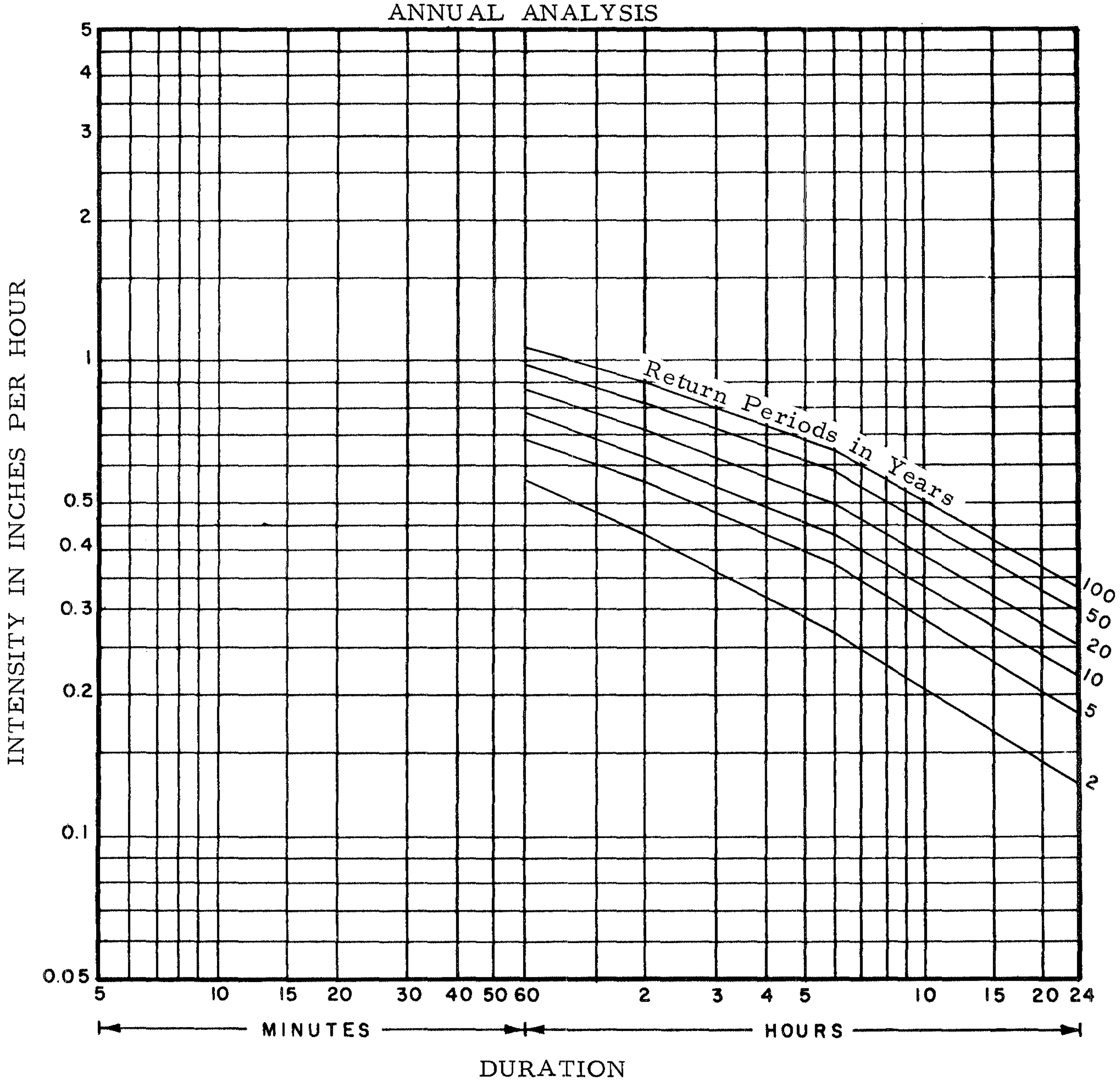
May 1964		FIGURE 5-9

PRECIPITATION
Intensity - Duration - Frequency
Gilroy 8 NE 1945-1961

ANNUAL ANALYSIS



Adjusted Mean Annual Precipitation - 22.4 inches

Station Index No. 341900

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May 1964		FIGURE 5-10

PRECIPITATION
Intensity - Duration - Frequency
"K" and "n" Values for $i = Kt^{-n}$

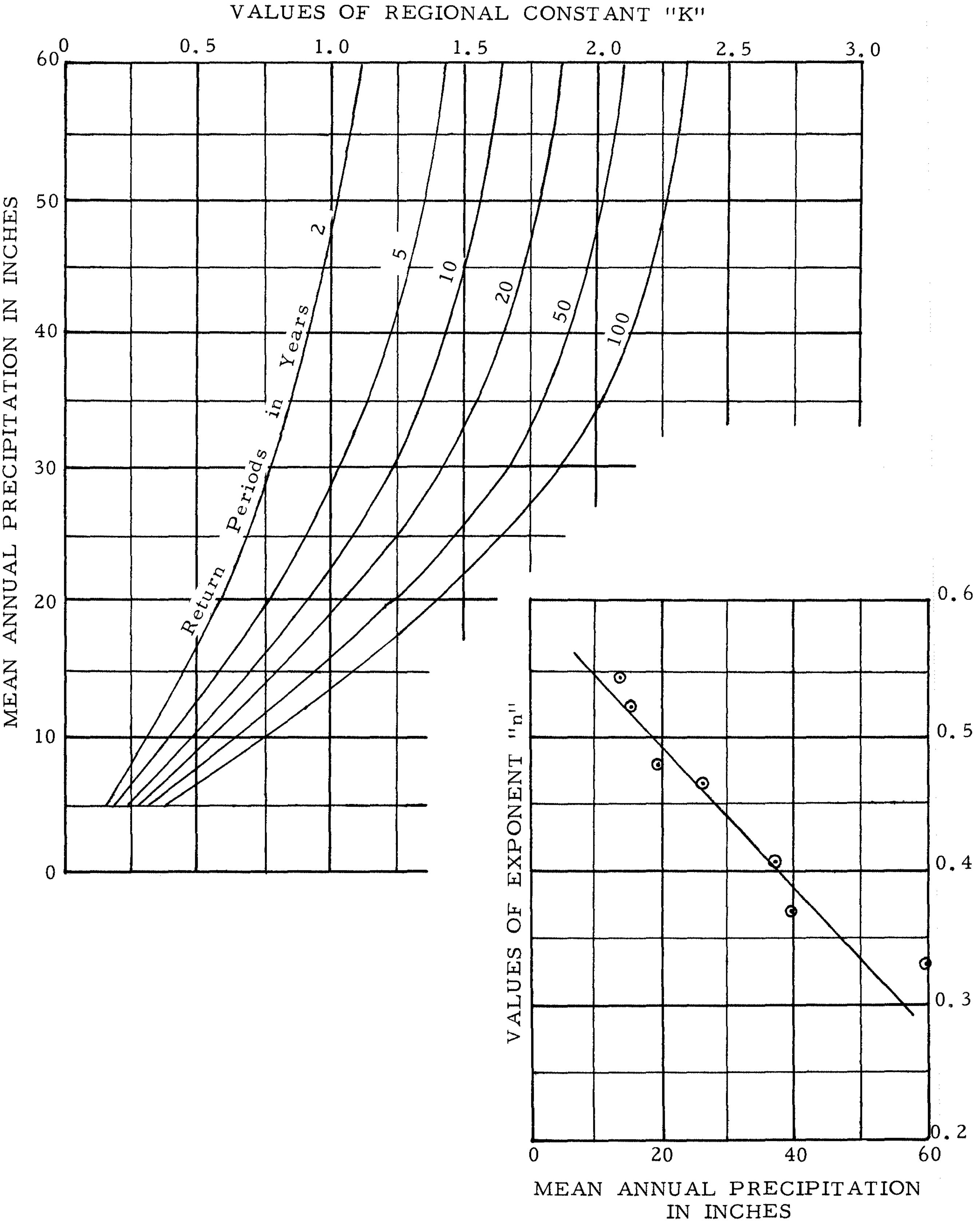

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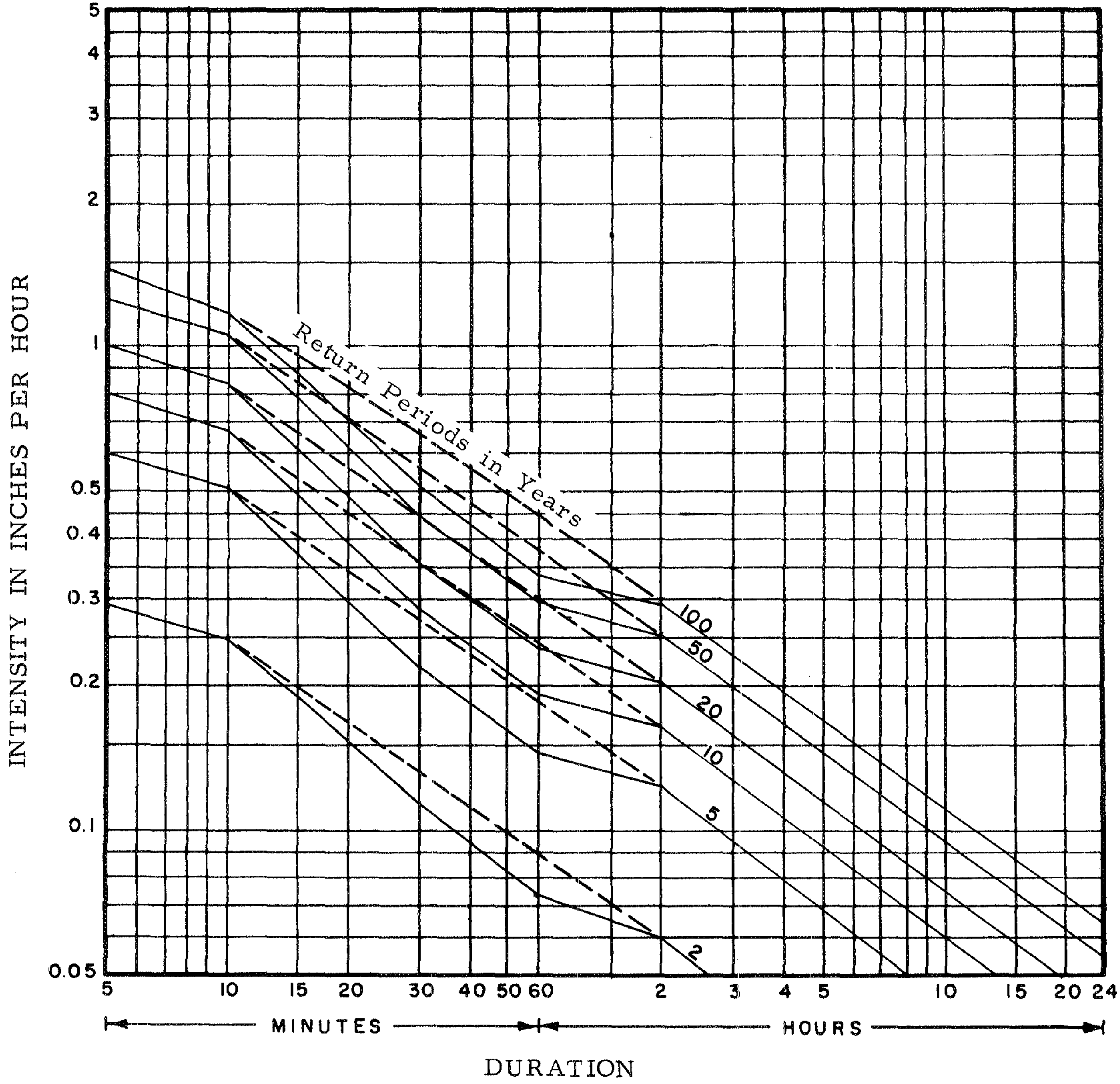
FIGURE 5-11

PRECIPITATION
Intensity - Duration - Frequency
San Jose September

MONTHLY ANALYSIS



LEGEND

- - - - Estimated

——— Computed

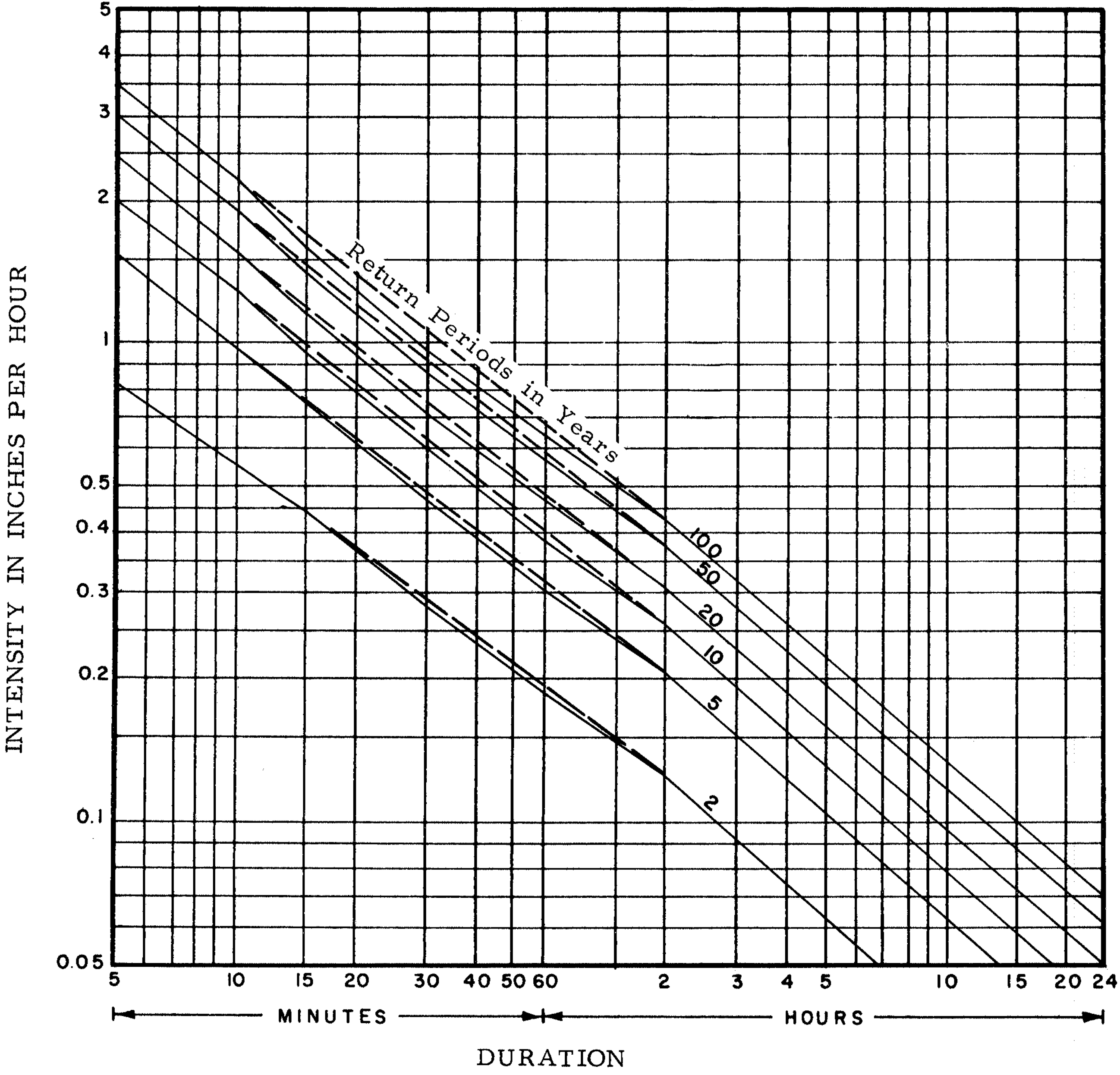
Station Index No. 782100

May 1964

FIGURE 5-12

PRECIPITATION
Intensity - Duration - Frequency
San Jose October

MONTHLY ANALYSIS



LEGEND

- - - - Estimated

——— Computed

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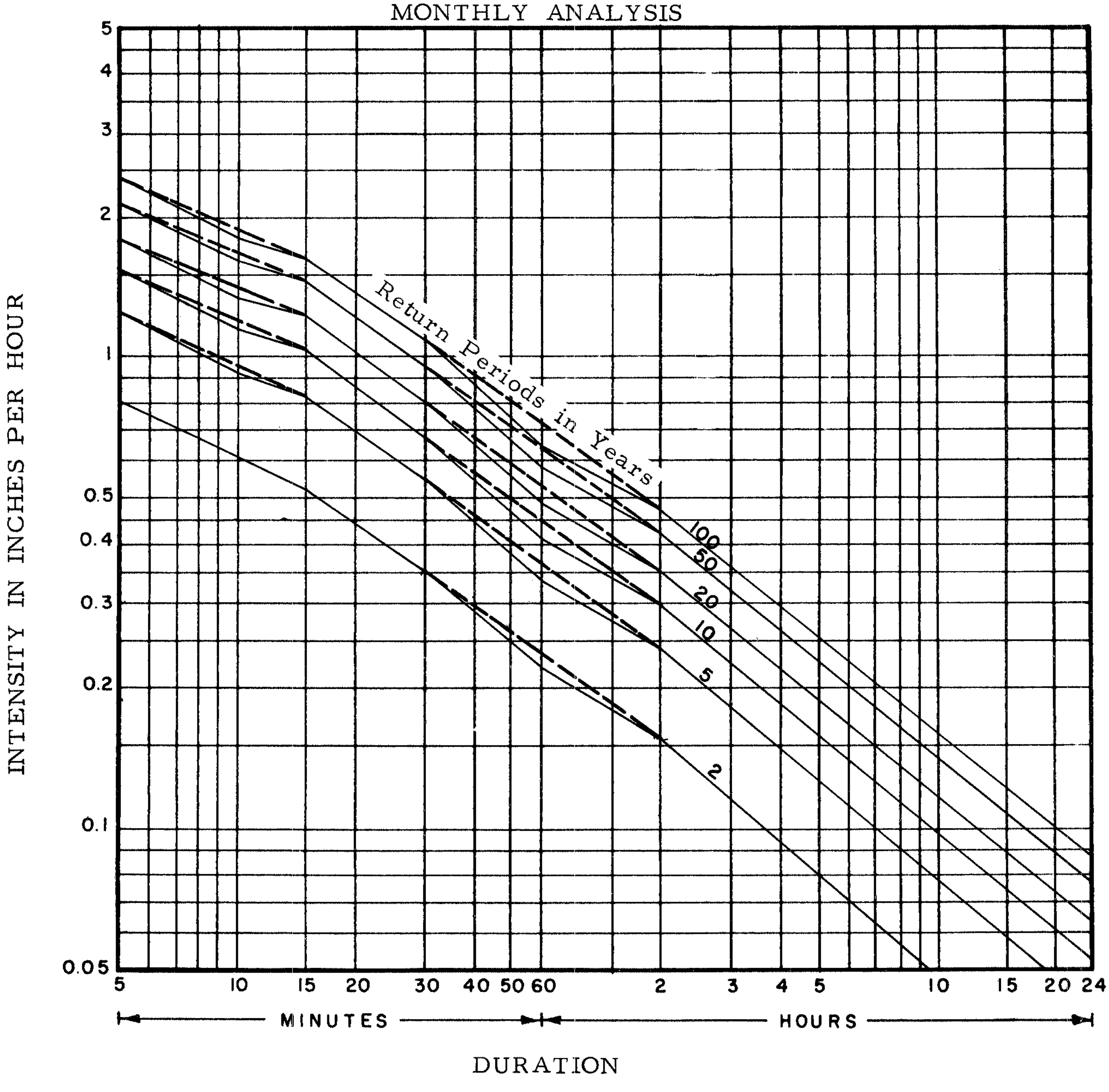
FIGURE 5-13

PRECIPITATION
Intensity - Duration - Frequency
San Jose November

MONTHLY ANALYSIS



LEGEND

---- Estimated

—— Computed

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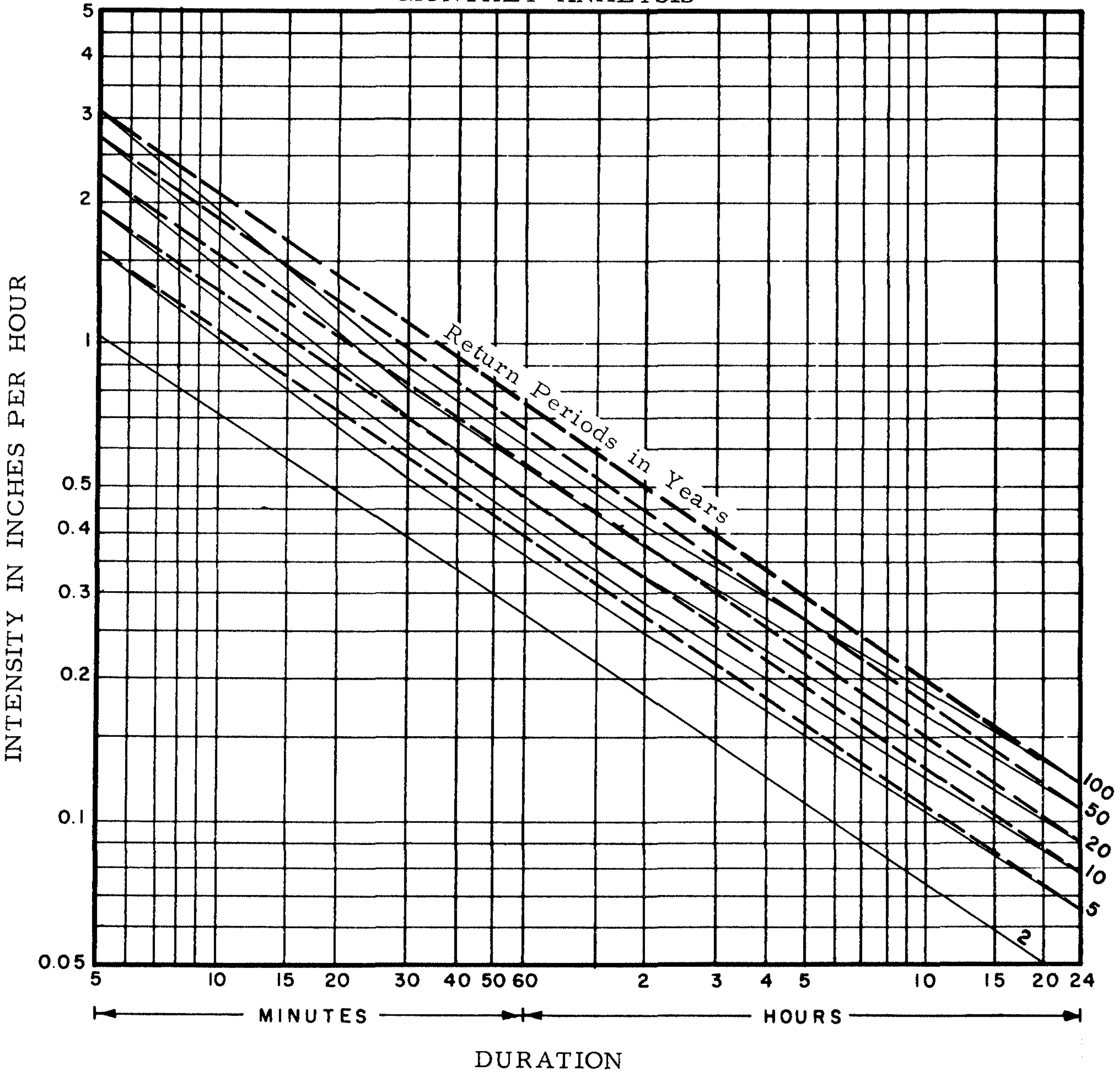
FIGURE 5-14

PRECIPITATION
Intensity - Duration - Frequency
San Jose December

MONTHLY ANALYSIS



LEGEND

- - - - Estimated

——— Computed

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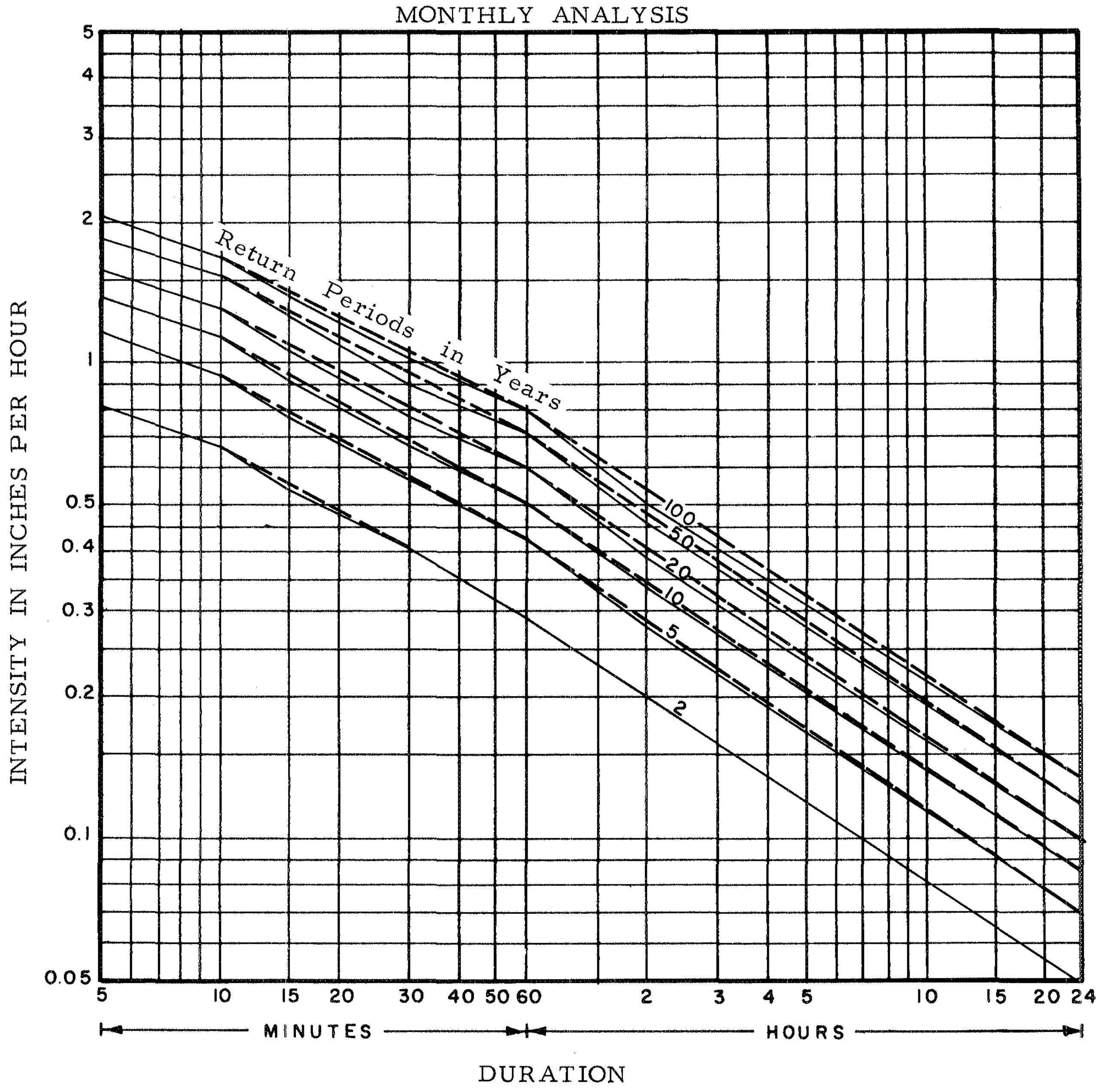
FIGURE 5-15

PRECIPITATION
Intensity - Duration - Frequency
San Jose January



LEGEND

- - - - Estimated

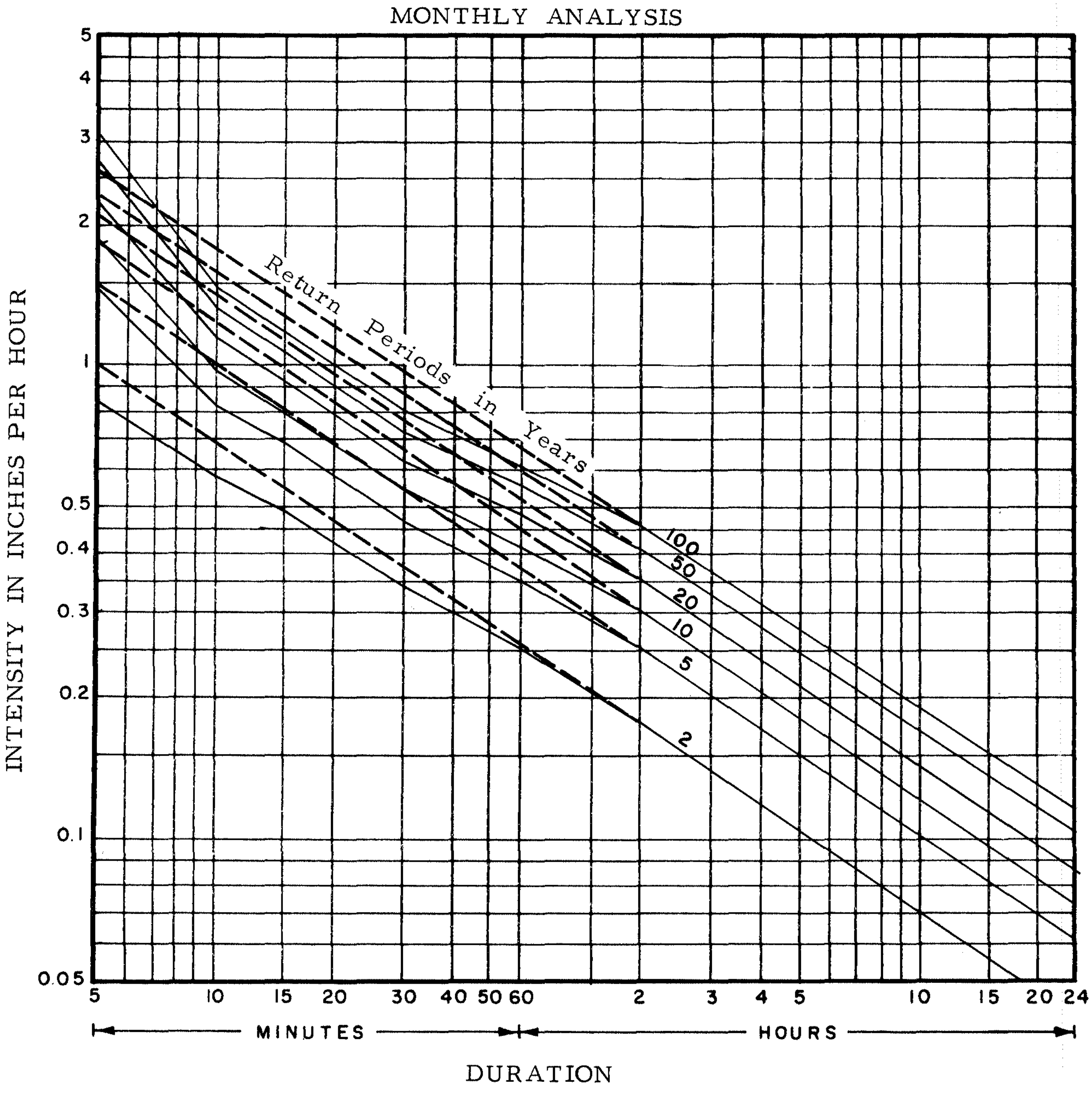
——— Computed

Station Index No. 782100

May 1964

FIGURE 5-16

PRECIPITATION
Intensity - Duration - Frequency
San Jose February



LEGEND

- - - - Estimated

——— Computed

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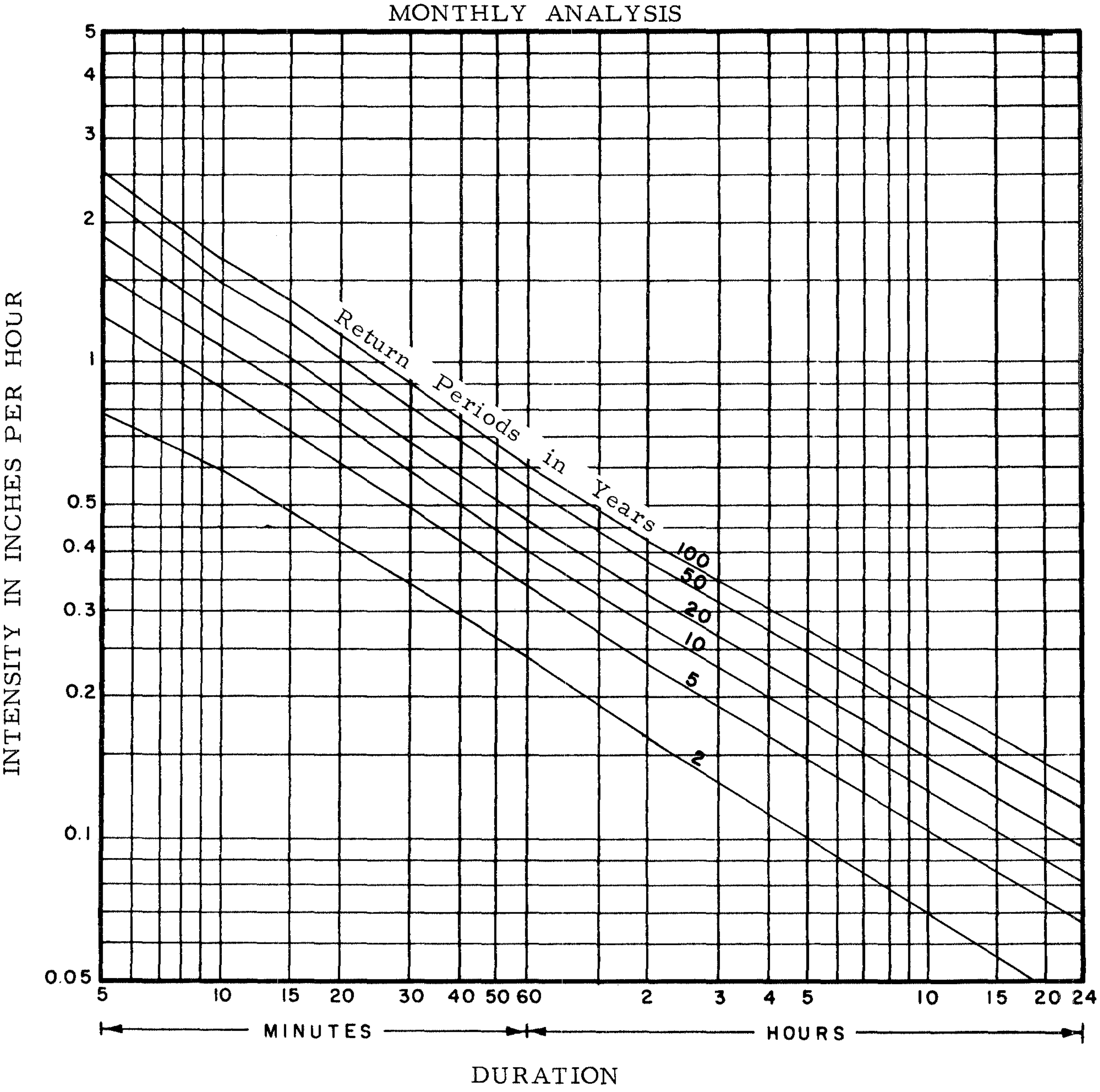
FIGURE 5-17

PRECIPITATION
Intensity - Duration - Frequency
San Jose March

MONTHLY ANALYSIS



LEGEND

---- Estimated

—— Computed

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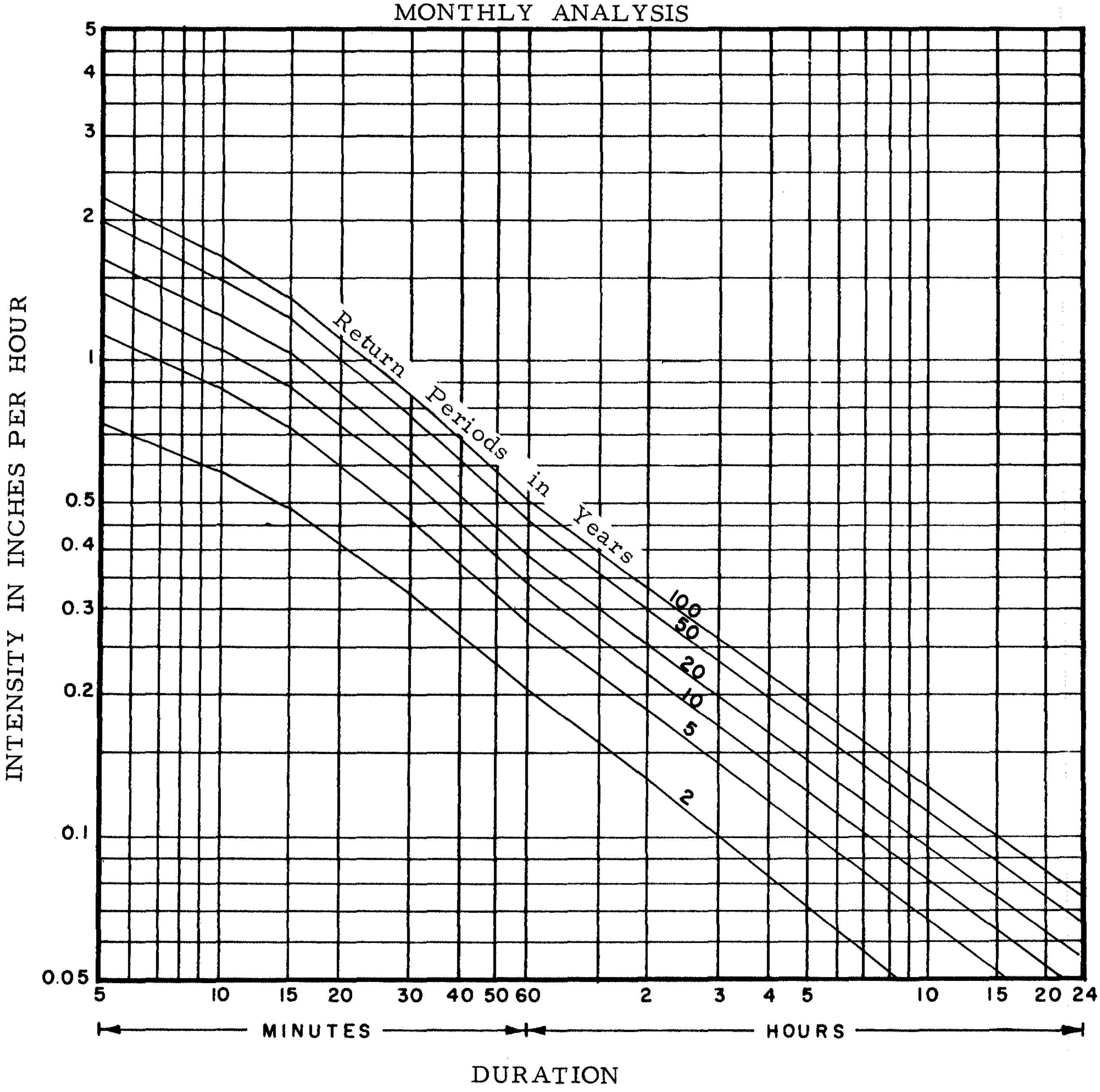
FIGURE 5-18

PRECIPITATION
Intensity - Duration - Frequency
San Jose April

MONTHLY ANALYSIS



LEGEND

---- Estimated

—— Computed

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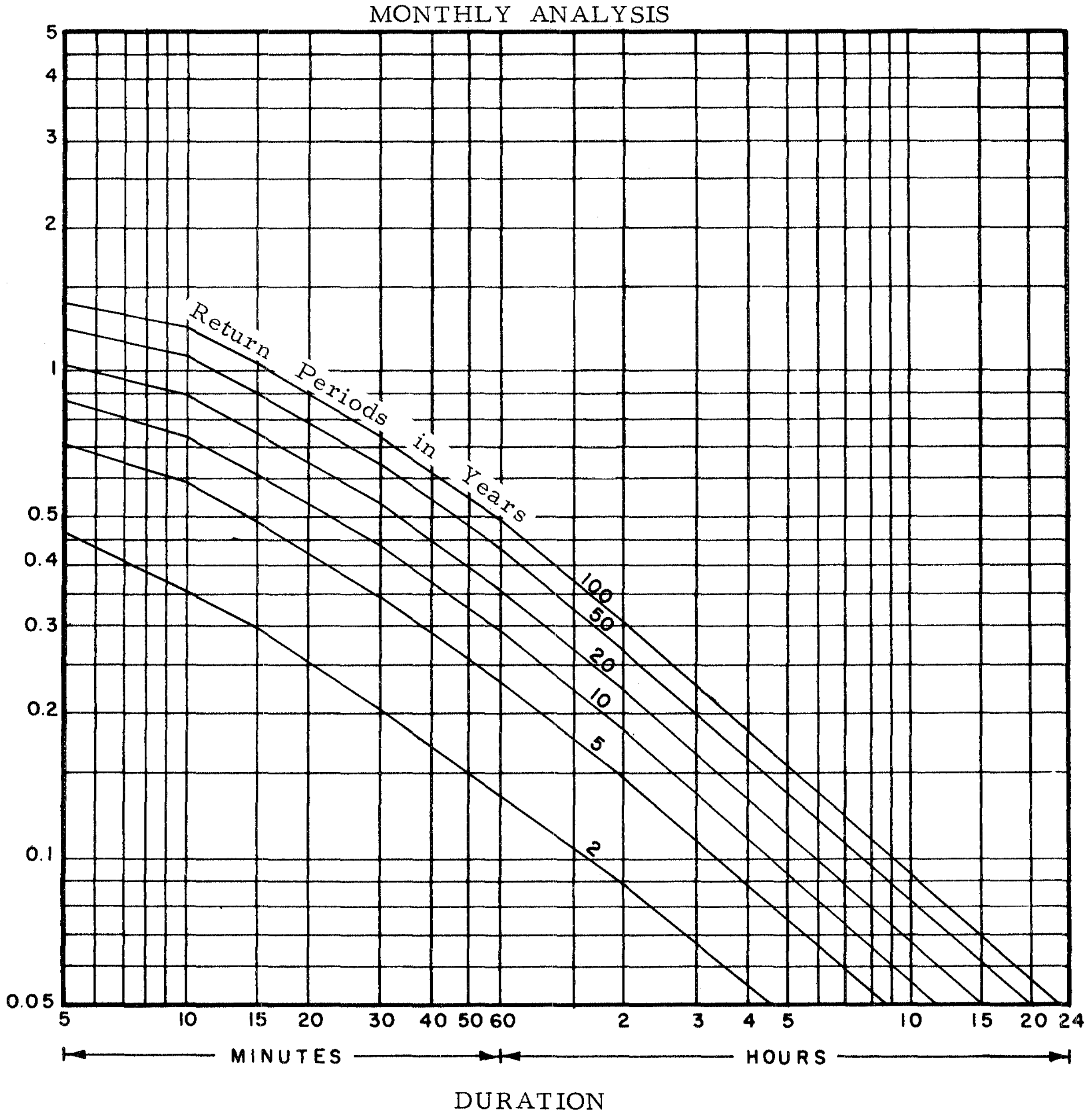
May 1964		FIGURE 5-19

PRECIPITATION
Intensity - Duration - Frequency
San Jose May



LEGEND

---- Estimated

——— Computed

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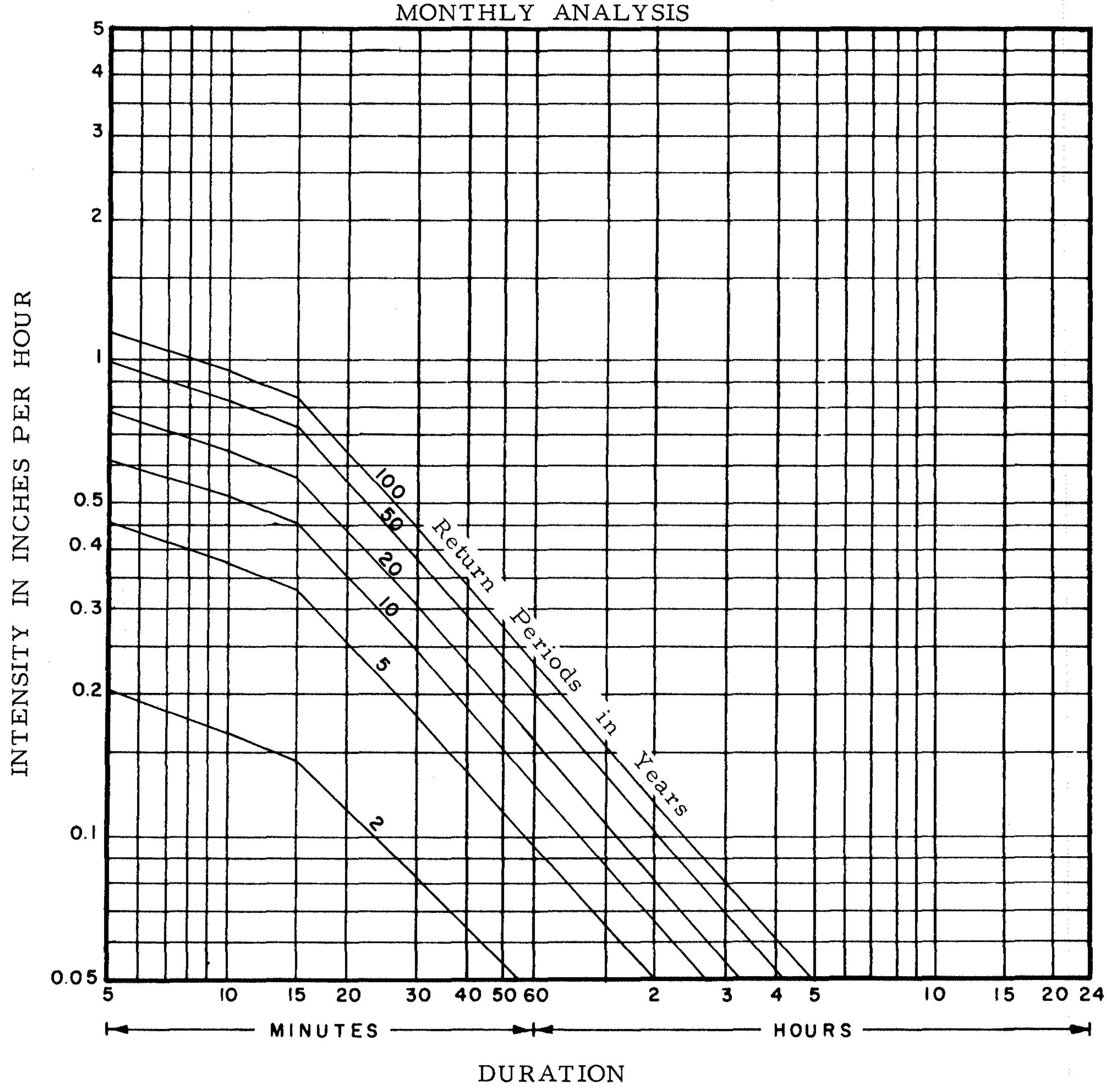
FIGURE 5-20

PRECIPITATION
Intensity - Duration - Frequency
San Jose June

MONTHLY ANALYSIS



LEGEND

---- Estimated

—— Computed

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FIGURE 6-1

FREQUENCY CURVE
PEAK STREAMFLOW
Arroyo Seco near Soledad 152000

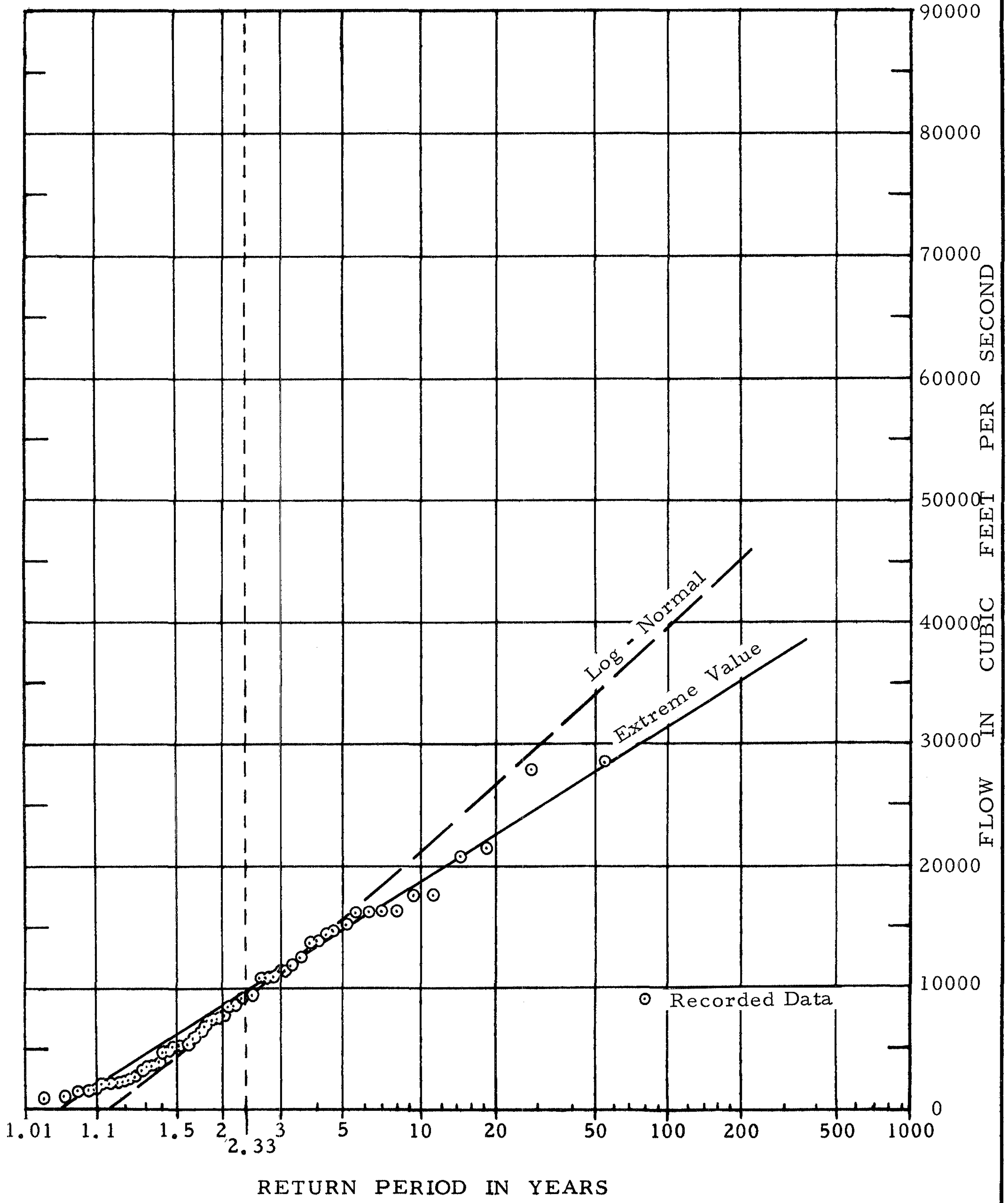

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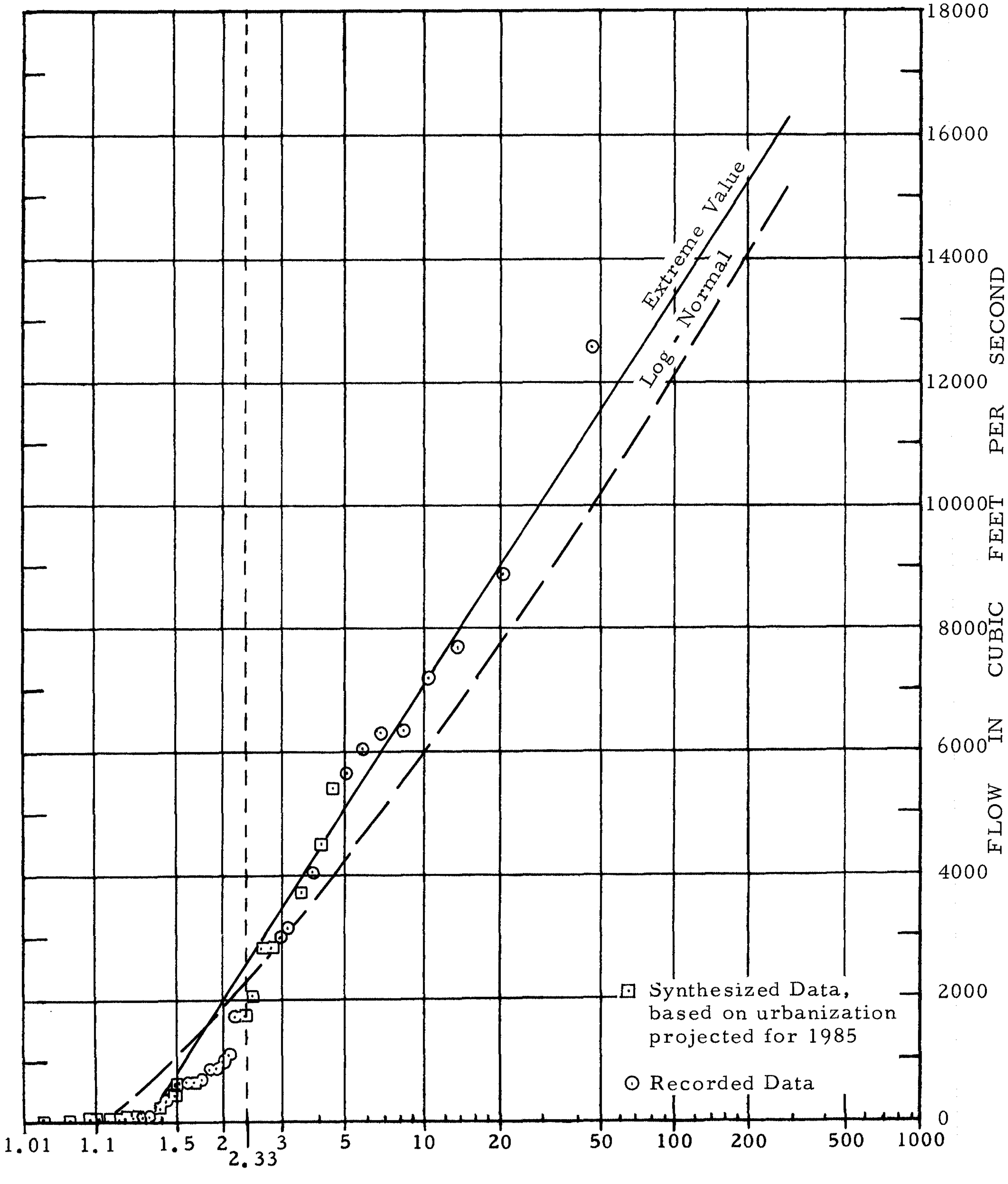
FIGURE 6-2

FREQUENCY CURVE
PEAK STREAMFLOW
Pacheco Creek near Dunneville * 153000



* record site "K", Synthesized streamflow data, Santa Clara County, SCCFCWD, 1964

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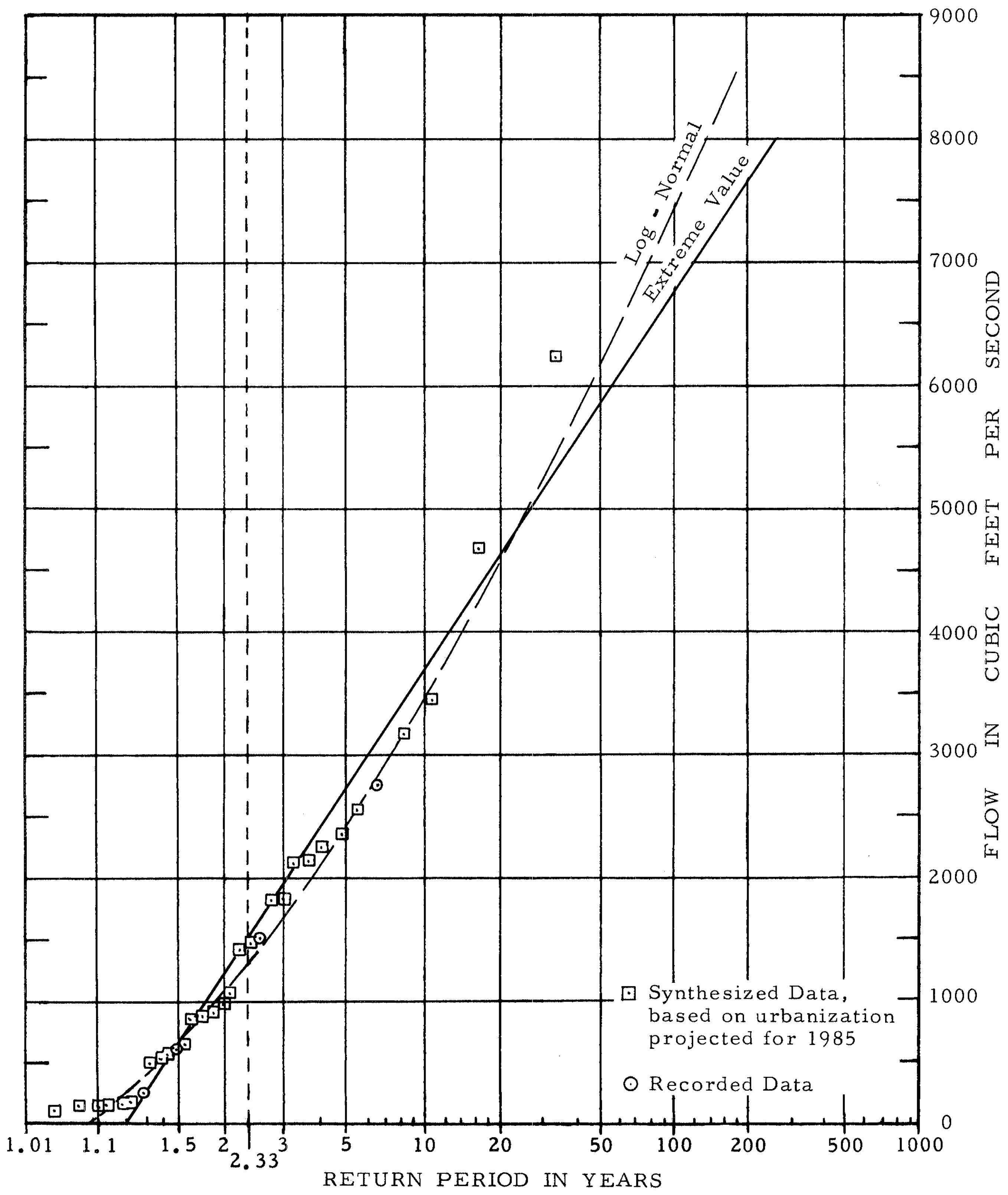
FIGURE 6-3

FREQUENCY CURVE
PEAK STREAMFLOW
Llagas Creek near Morgan Hill * 153500



* record site "I", Synthesized streamflow data, Santa Clara County, SCCFCWD, 1964

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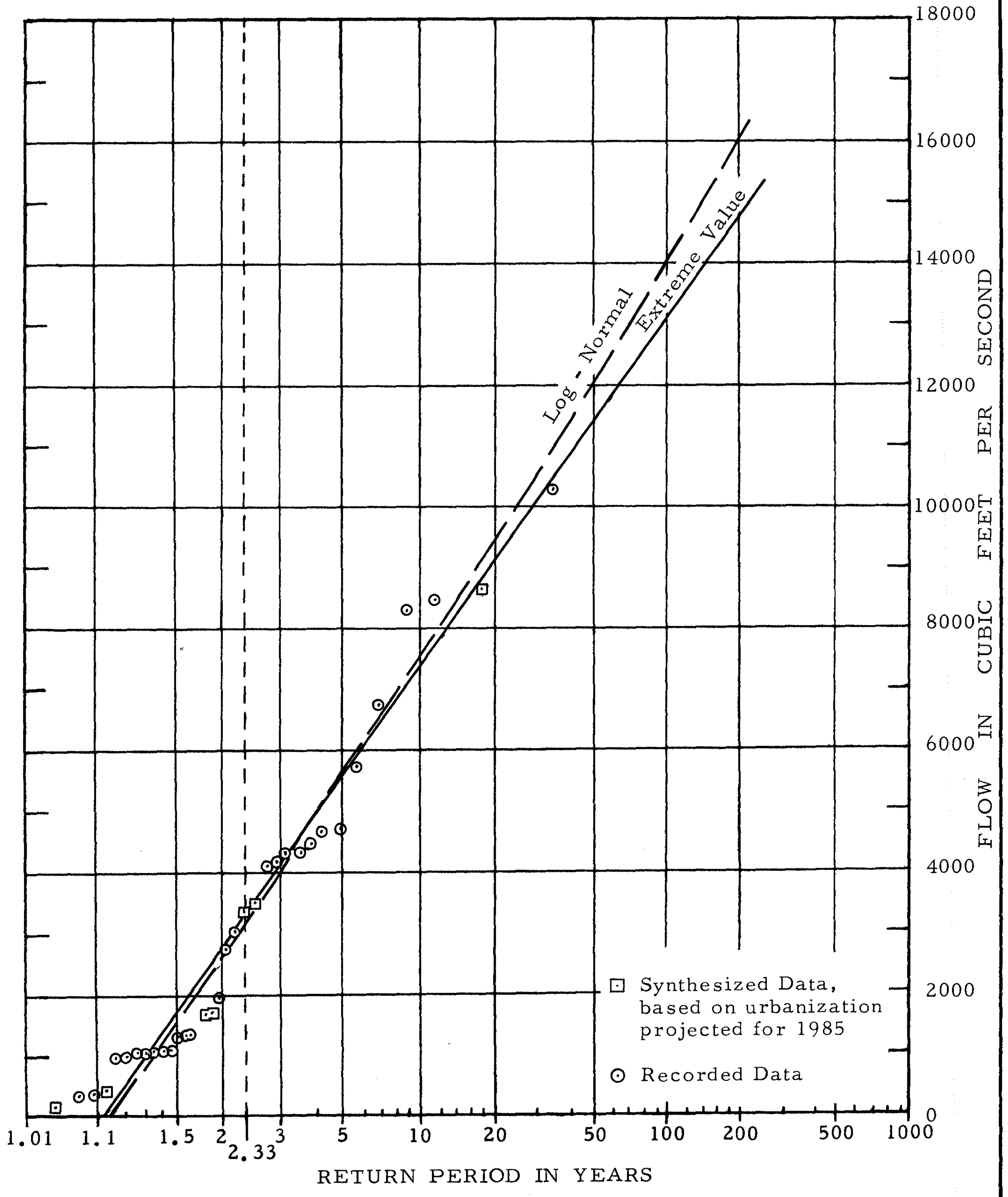
FIGURE 6-4

FREQUENCY CURVE
PEAK STREAMFLOW
Uvas Creek near Morgan Hill * 154000



* record site "P", Synthesized streamflow data, Santa Clara County, SCCFCWD, 1964

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FIGURE 6-5

FREQUENCY CURVE
PEAK STREAMFLOW
Pajaro River near Chittenden 159000

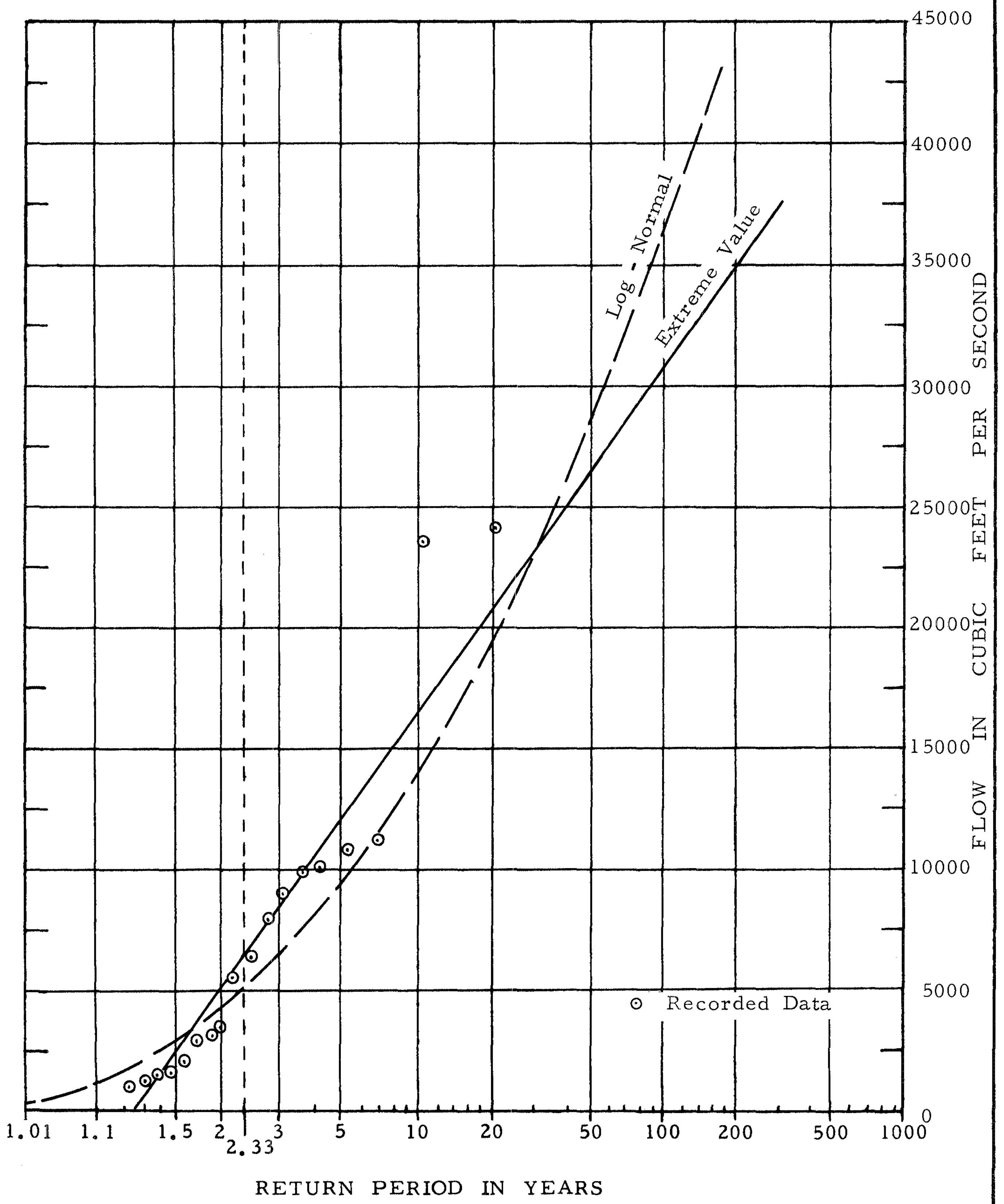

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FIGURE 6-6

FREQUENCY CURVE
PEAK STREAMFLOW
San Lorenzo River at Big Trees 160500

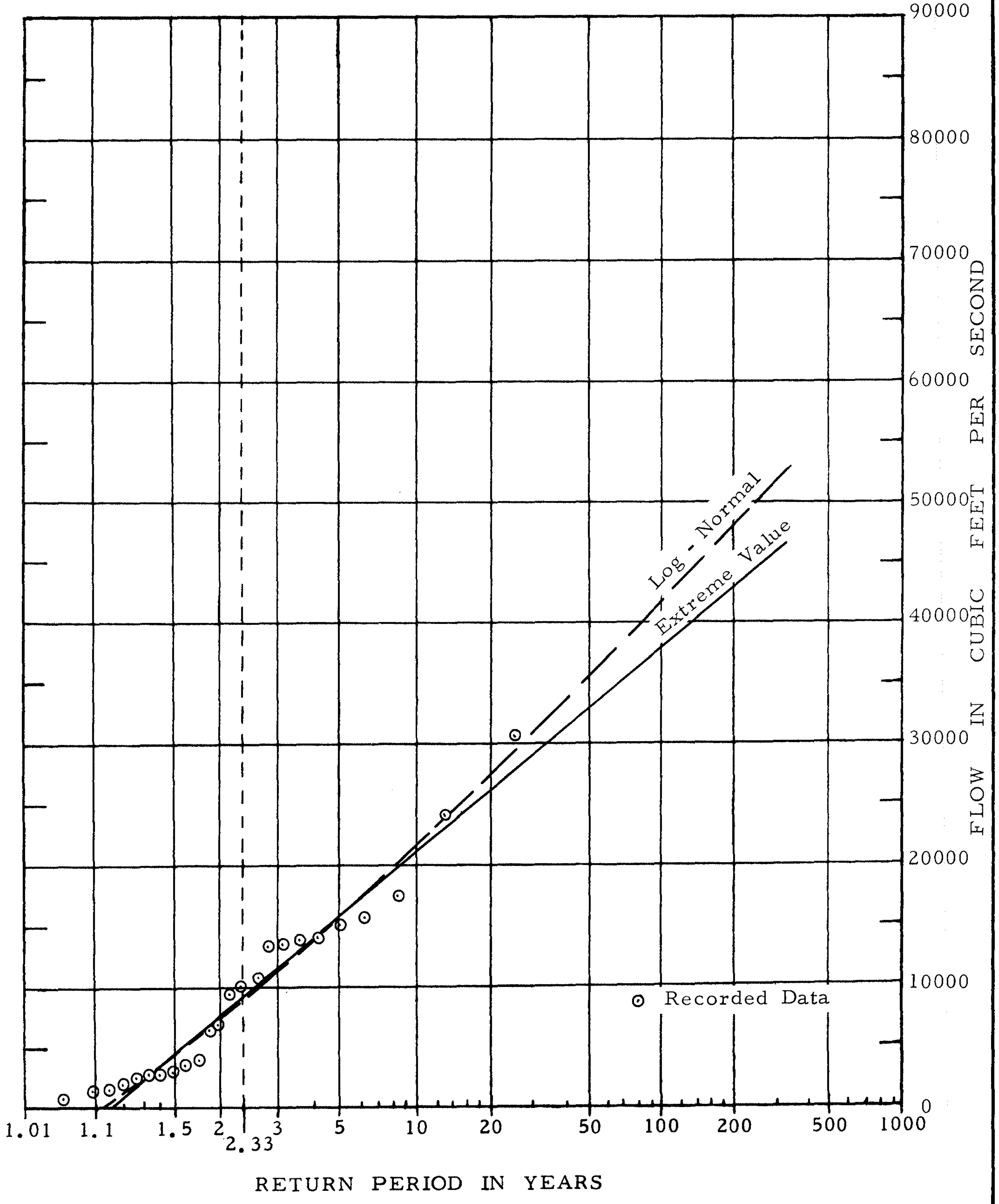

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FIGURE 6-7

FREQUENCY CURVE
PEAK STREAMFLOW
San Francisquito Creek 164500

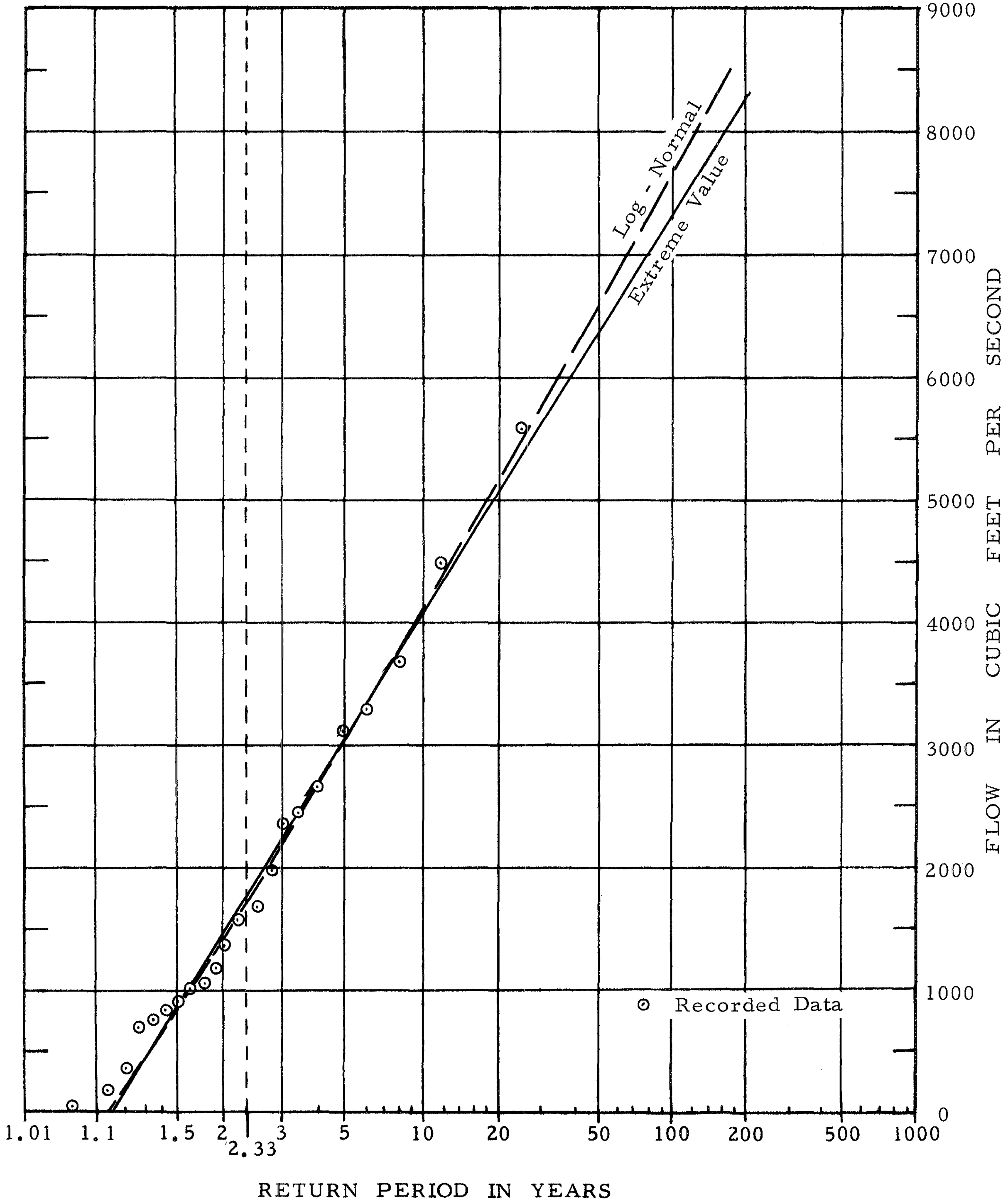

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FIGURE 6-8

FREQUENCY CURVE
PEAK STREAMFLOW
Stevens Creek 166500

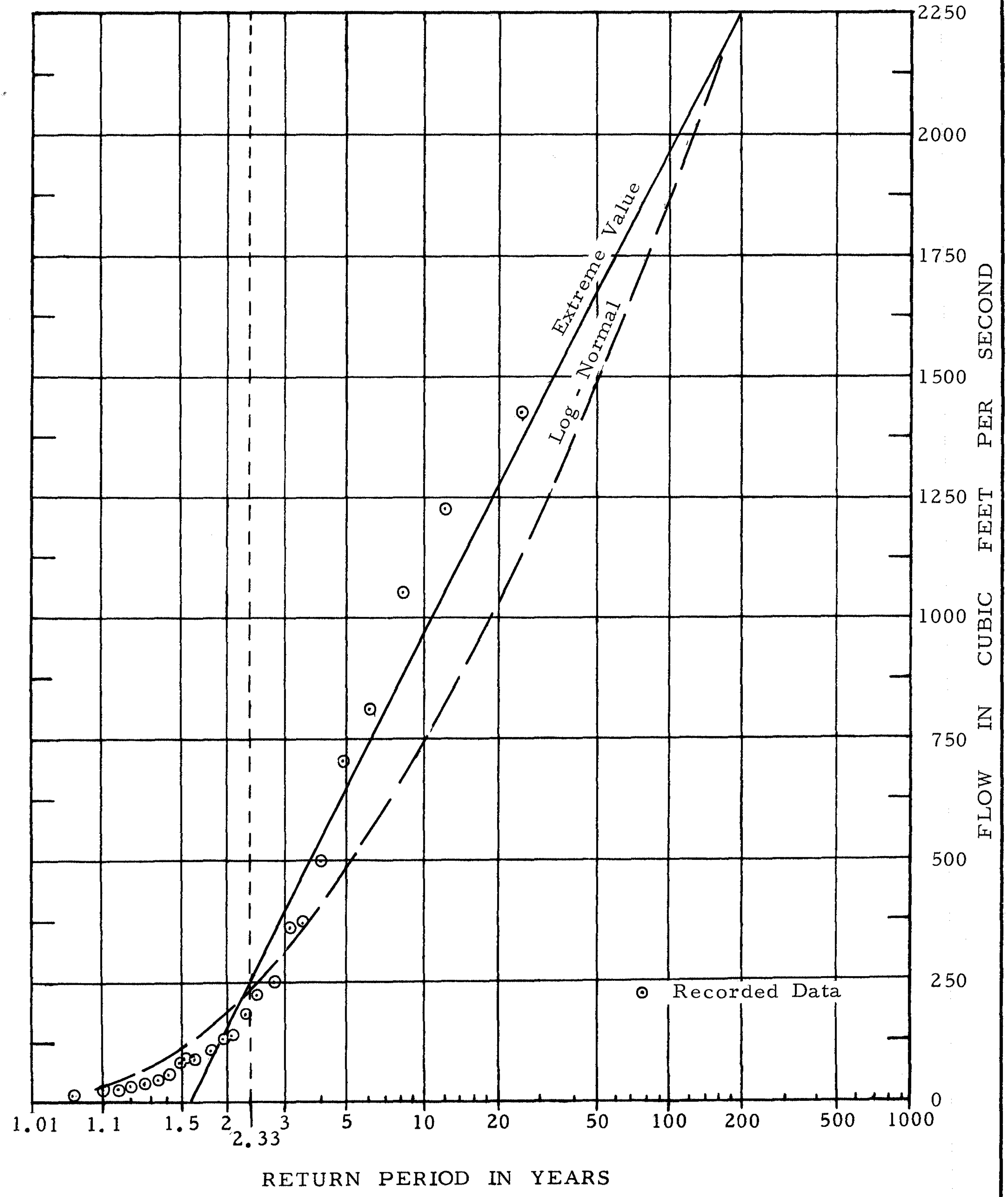

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FIGURE 6-9

FREQUENCY CURVE
PEAK STREAMFLOW
Permanente Creek 166580

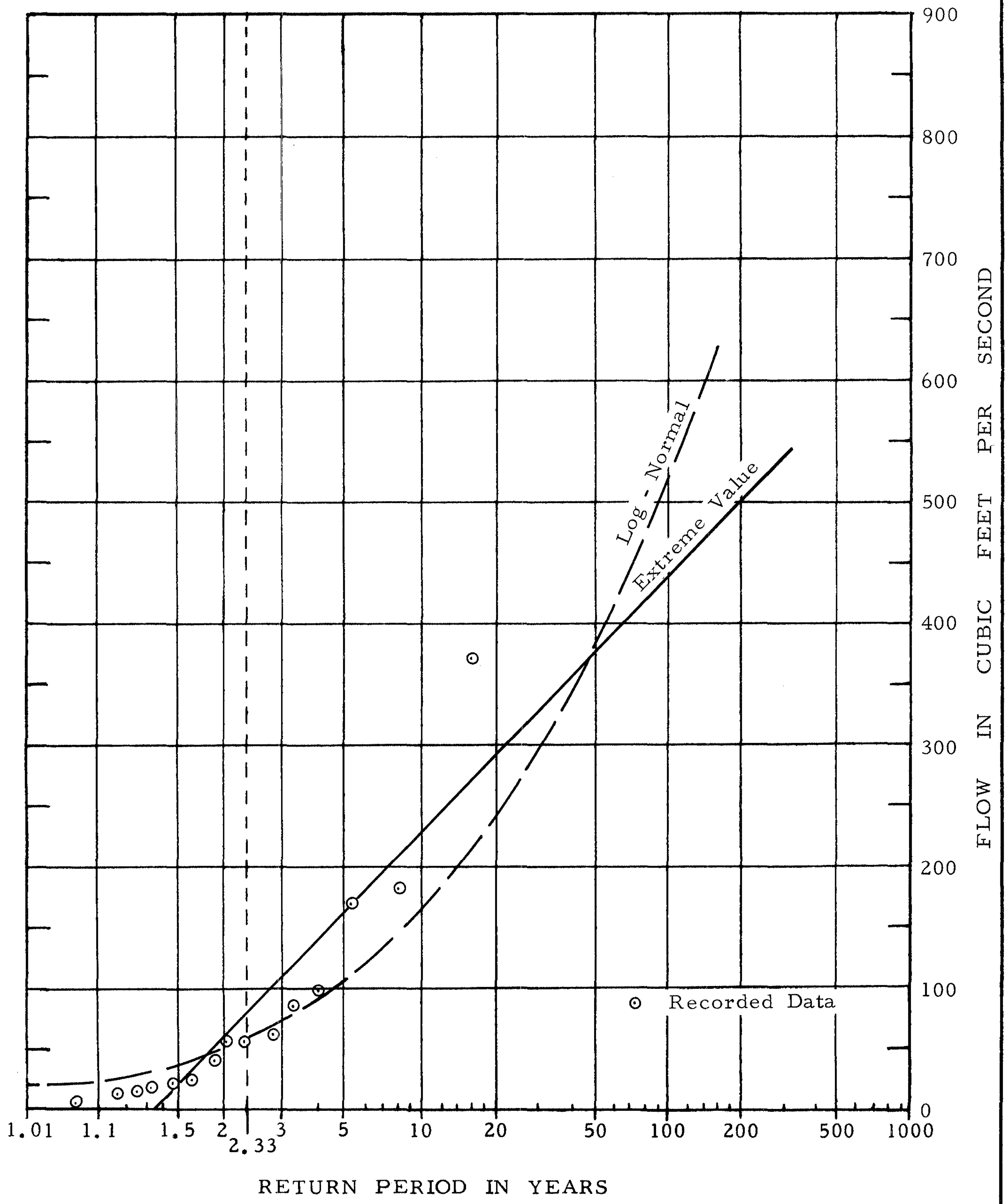

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FIGURE 6-10

FREQUENCY CURVE
PEAK STREAMFLOW
Hale (Magdalena) Creek 166610

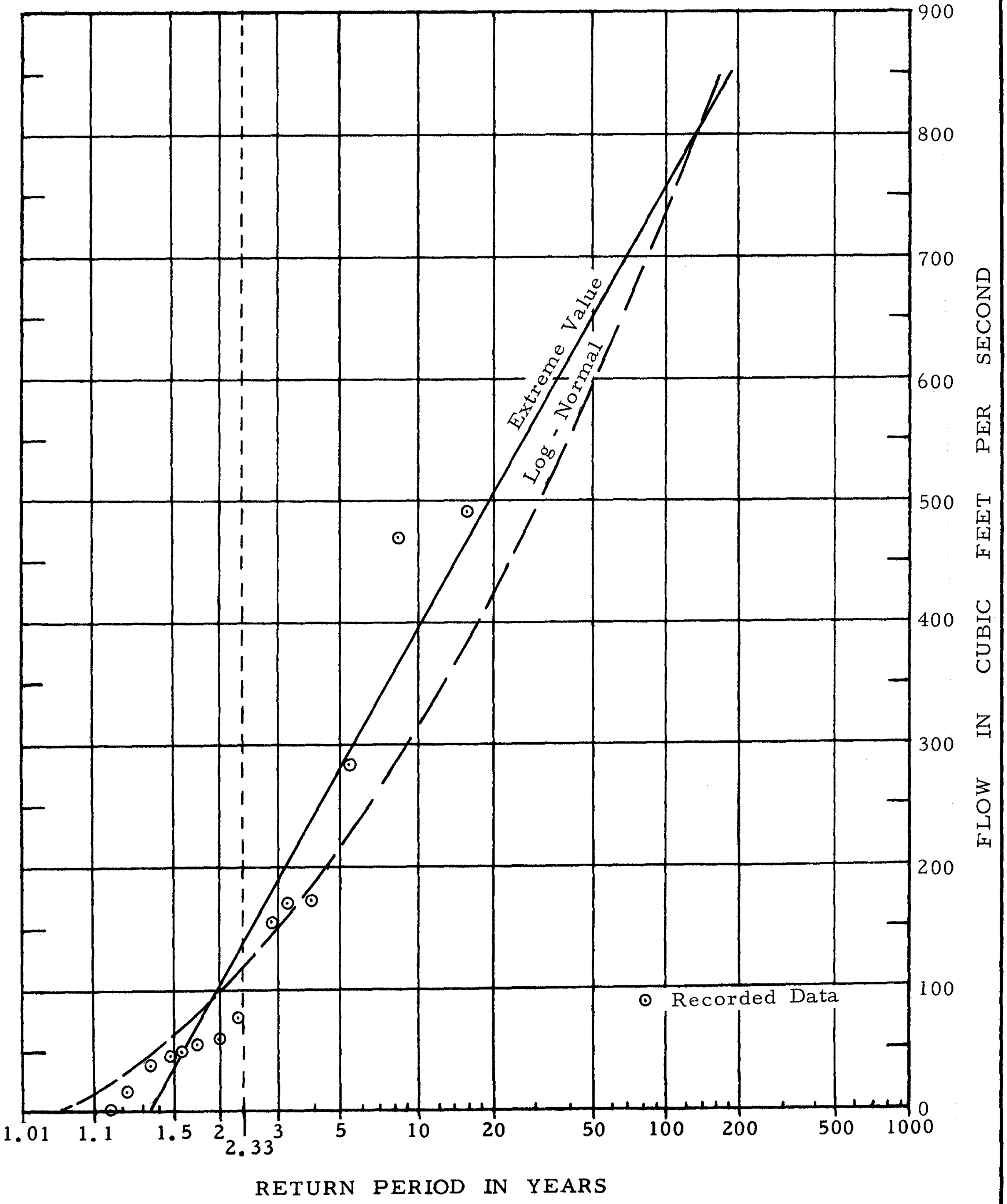

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FIGURE 6-11

FREQUENCY CURVE
PEAK STREAMFLOW
Alamitos Creek 167000

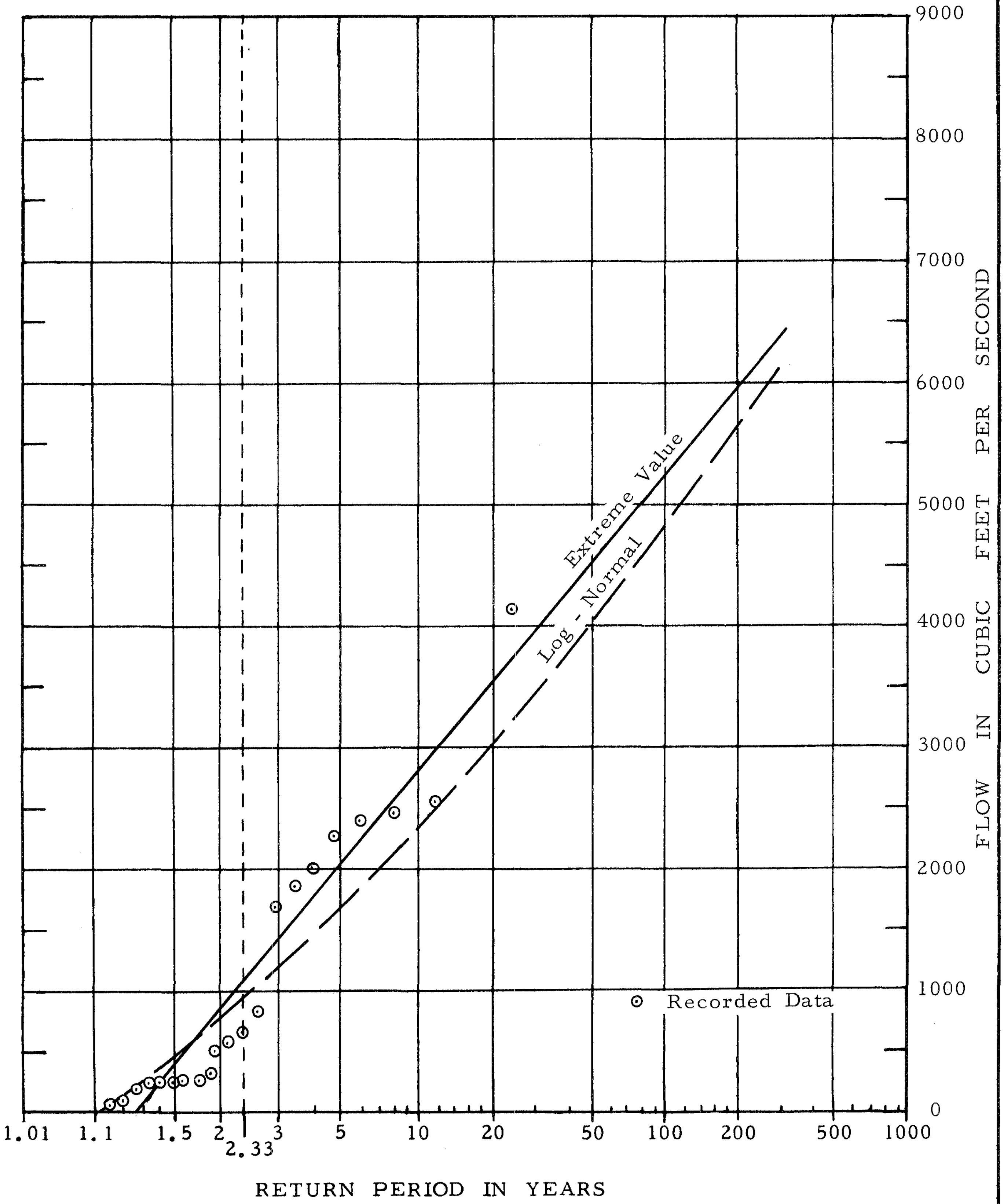

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FIGURE 6-12

FREQUENCY CURVE
PEAK STREAMFLOW
Guadalupe Creek 167500

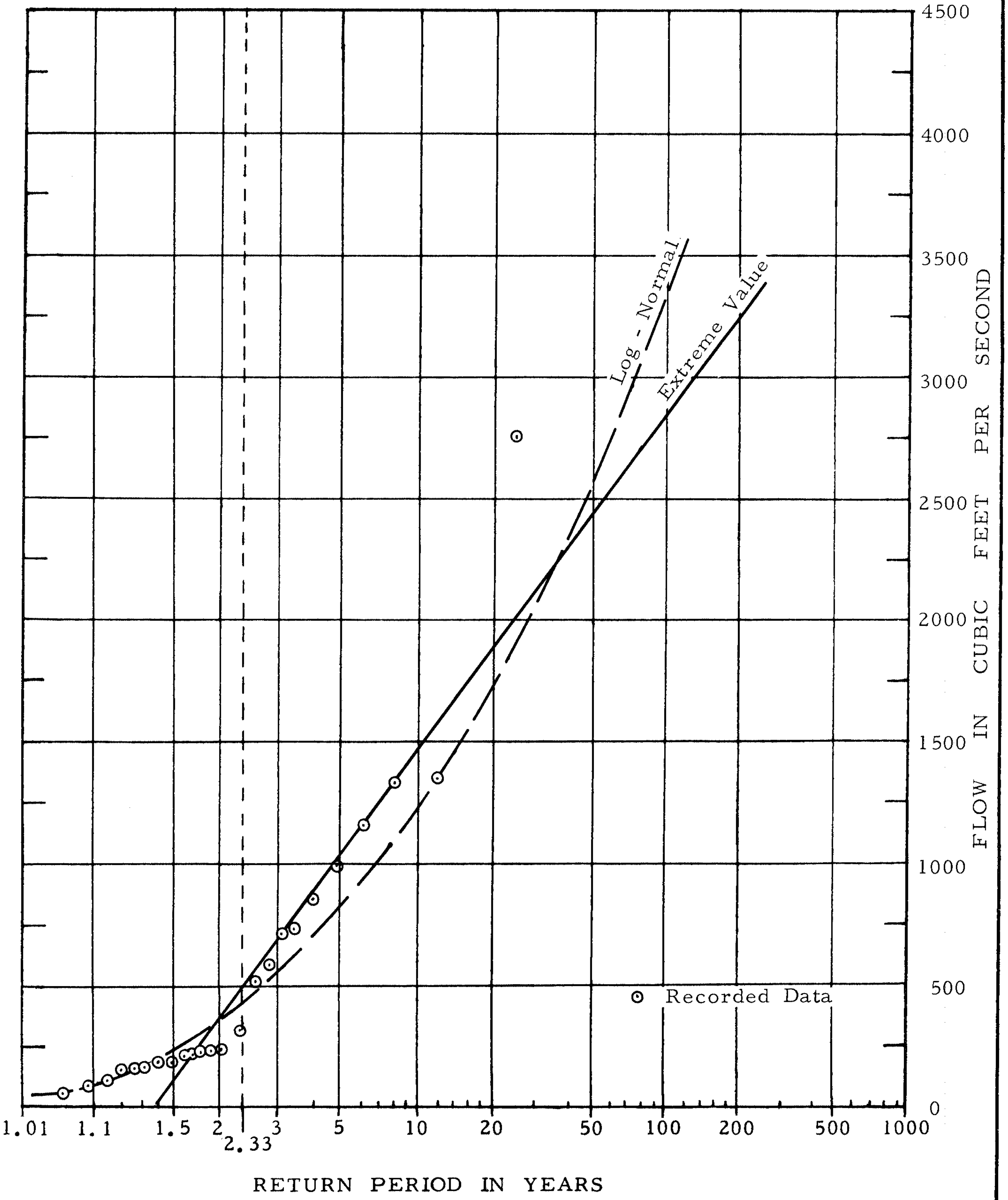

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FIGURE 6-13

FREQUENCY CURVE
PEAK STREAMFLOW
Ross Creek 167640

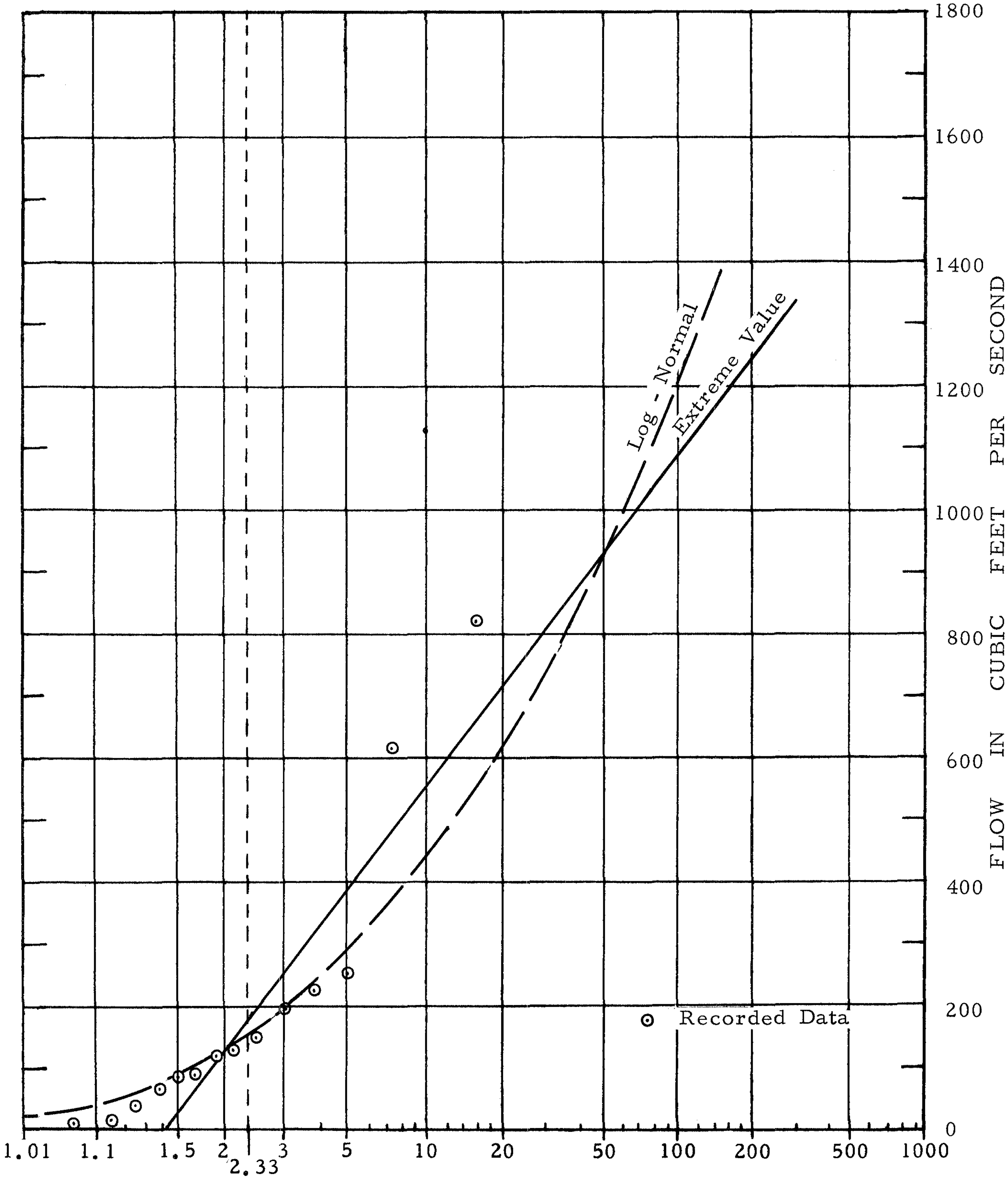

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FIGURE 6-14

FREQUENCY CURVE
PEAK STREAMFLOW
Los Gatos Creek 168000

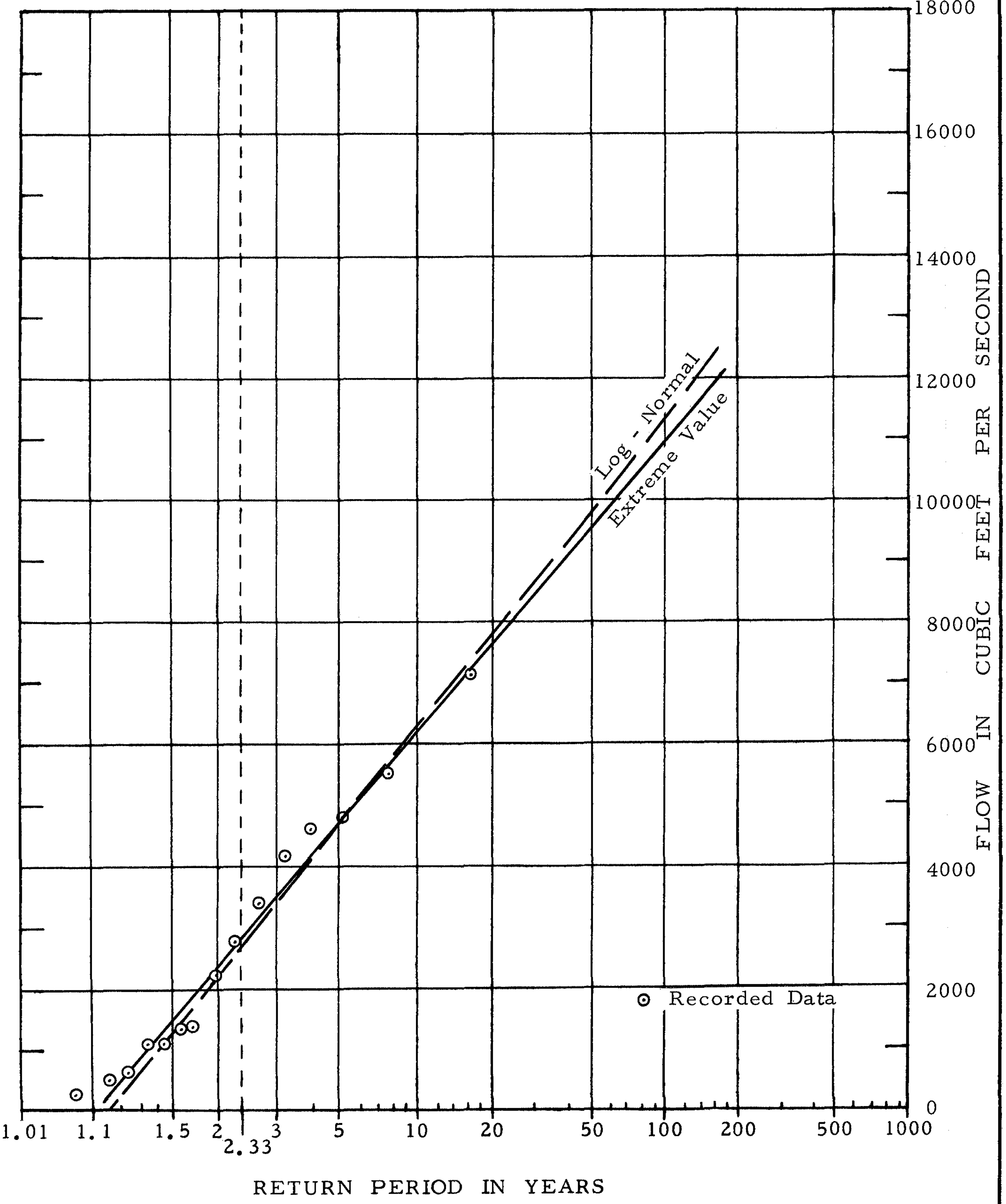

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FIGURE 6-15

FREQUENCY CURVE
PEAK STREAMFLOW
San Tomas Creek 169070

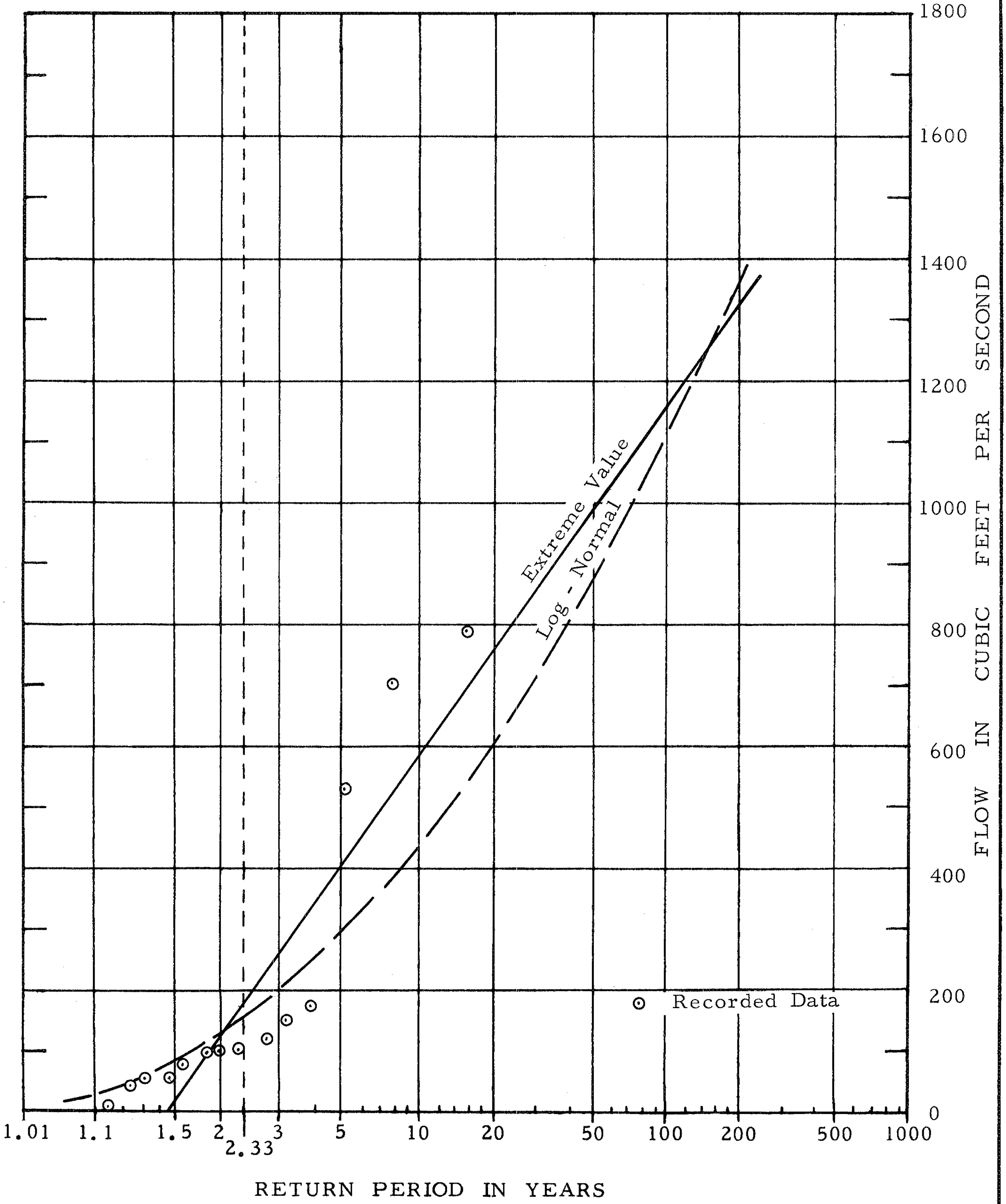

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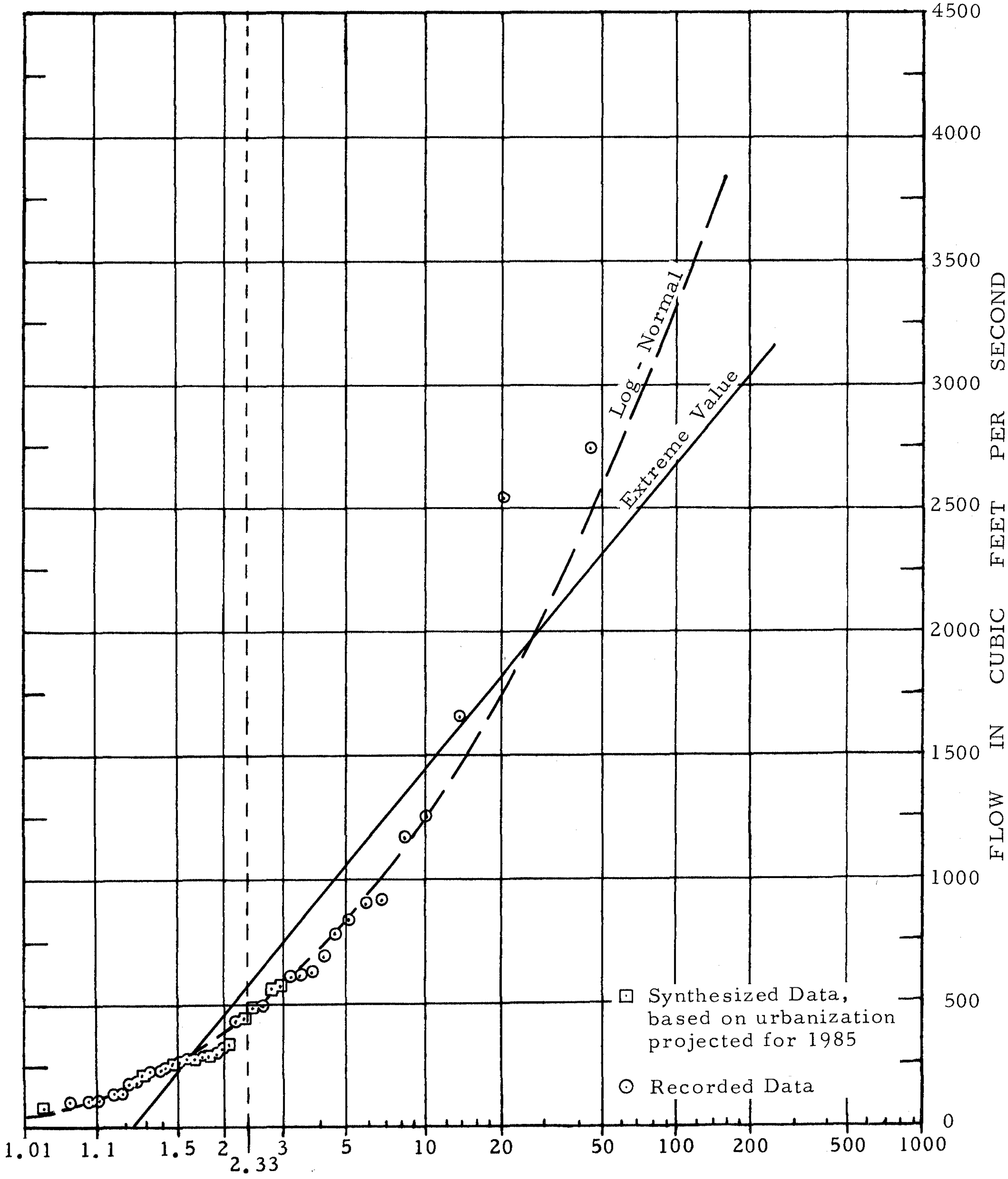
FIGURE 6-16

FREQUENCY CURVE
PEAK STREAMFLOW
Saratoga Creek at Saratoga * 169500



* record site "M", Synthesized streamflow data, Santa Clara County, SCCFCWD, 1964

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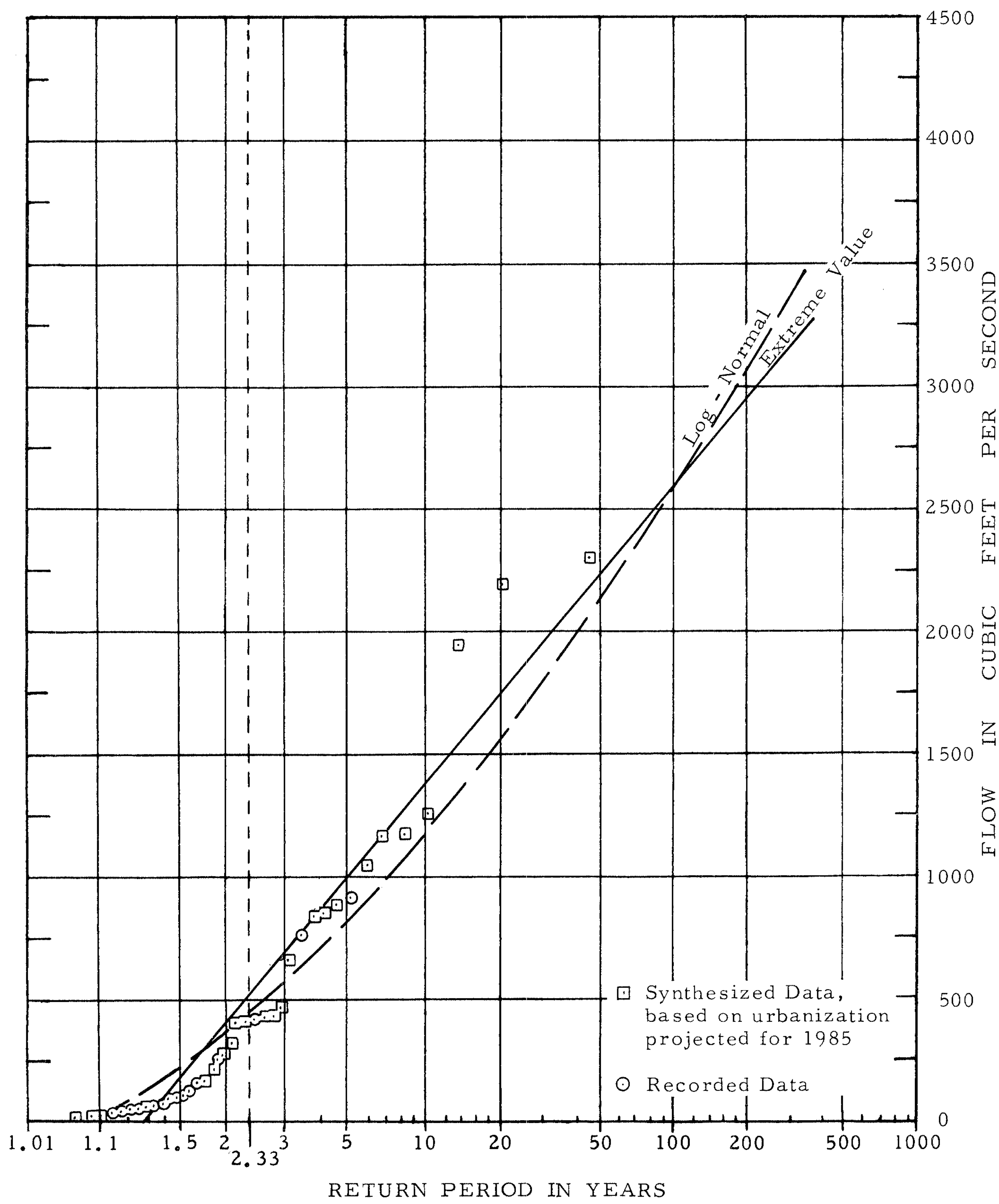
FIGURE 6-17

FREQUENCY CURVE
PEAK STREAMFLOW
Penitencia Creek near San Jose * 172120



* record site "L", Synthesized streamflow data, Santa Clara County, SCCFCWD, 1964

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FIGURE 6-18

FREQUENCY CURVE
PEAK STREAMFLOW
Alameda Creek 173000

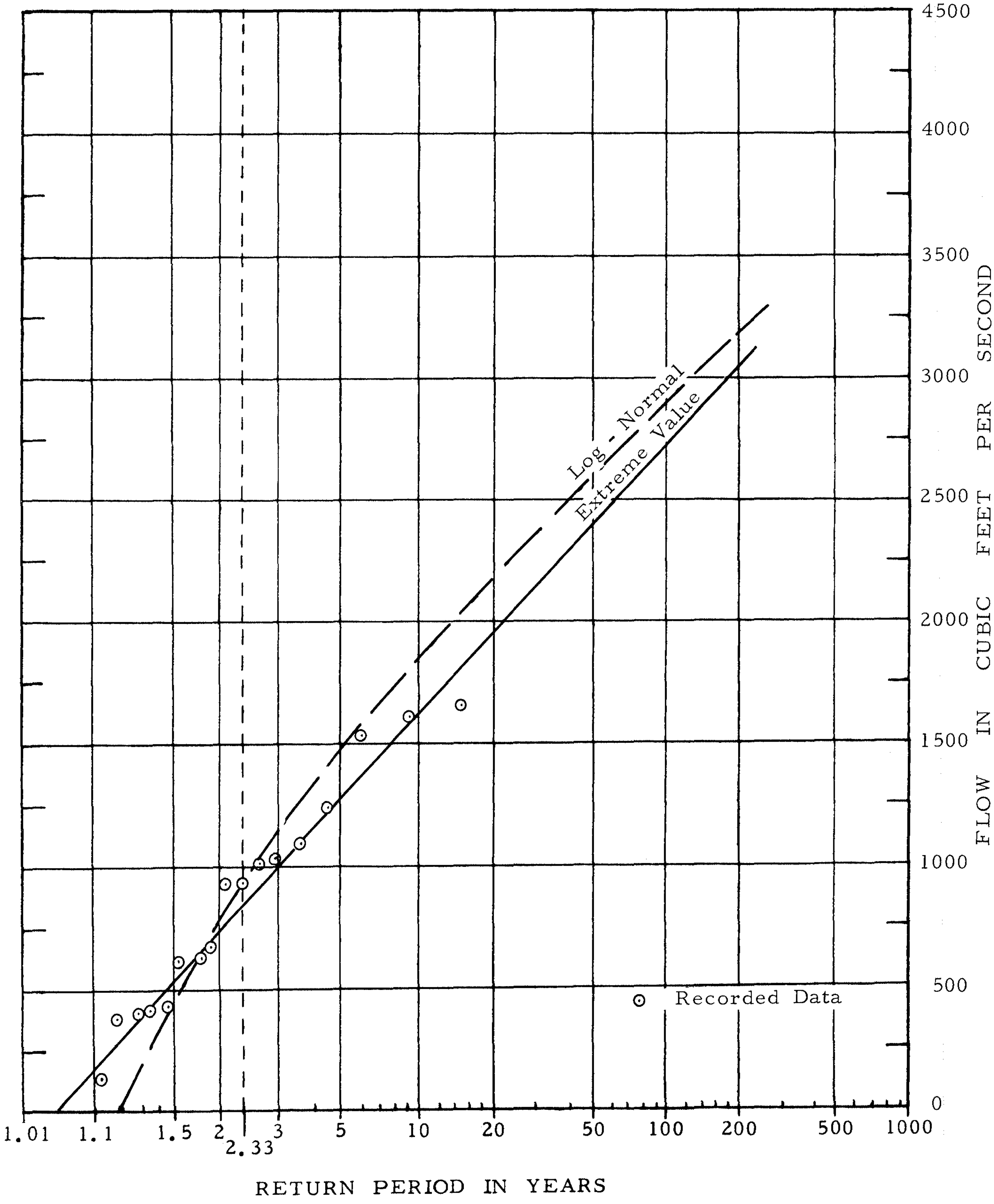

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FIGURE 6-19

FREQUENCY CURVE
PEAK STREAMFLOW
Arroyo Mocho Creek 176000

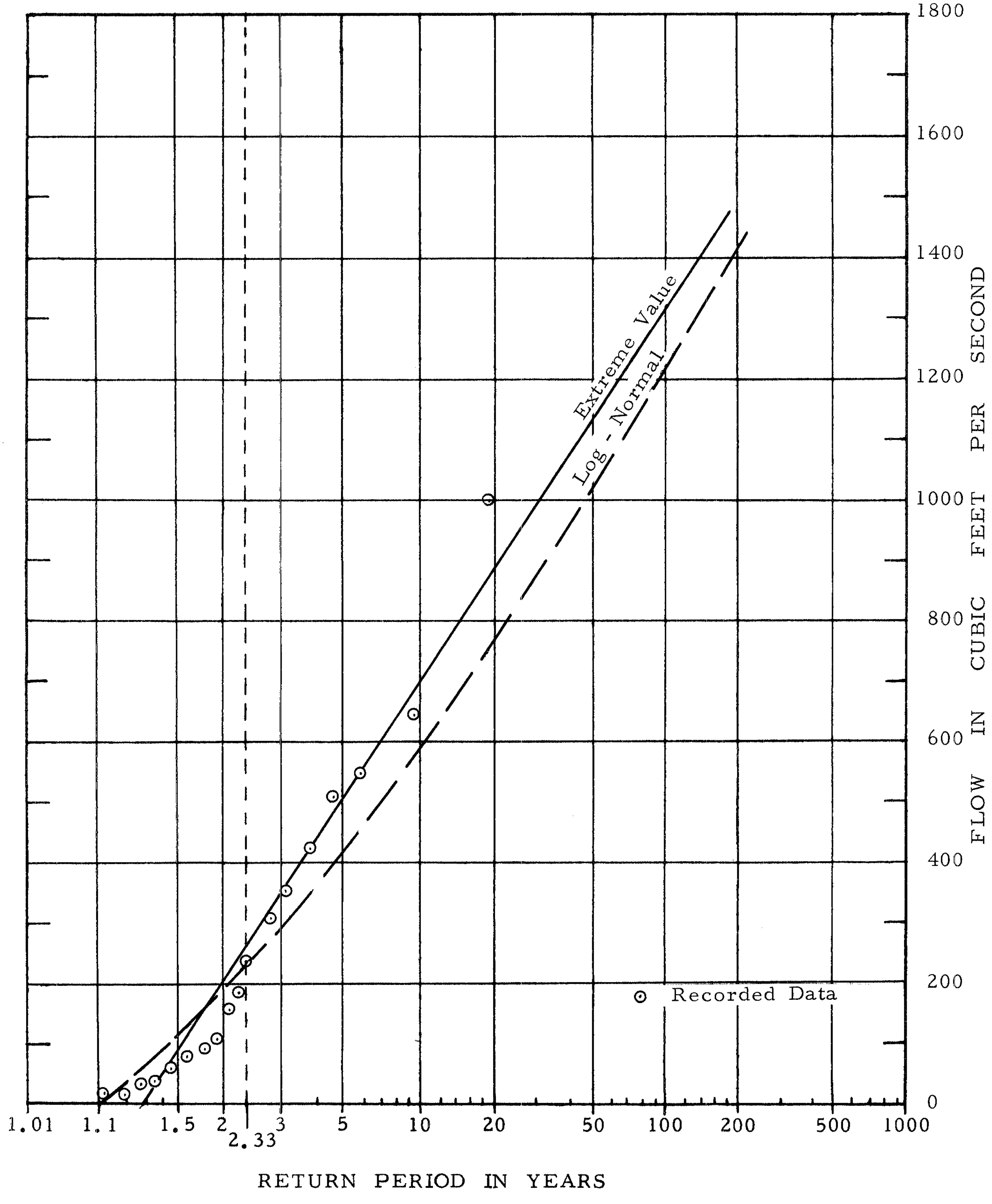

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FIGURE 6-20

FREQUENCY CURVE
PEAK STREAMFLOW
Arroyo Valle Creek 176500

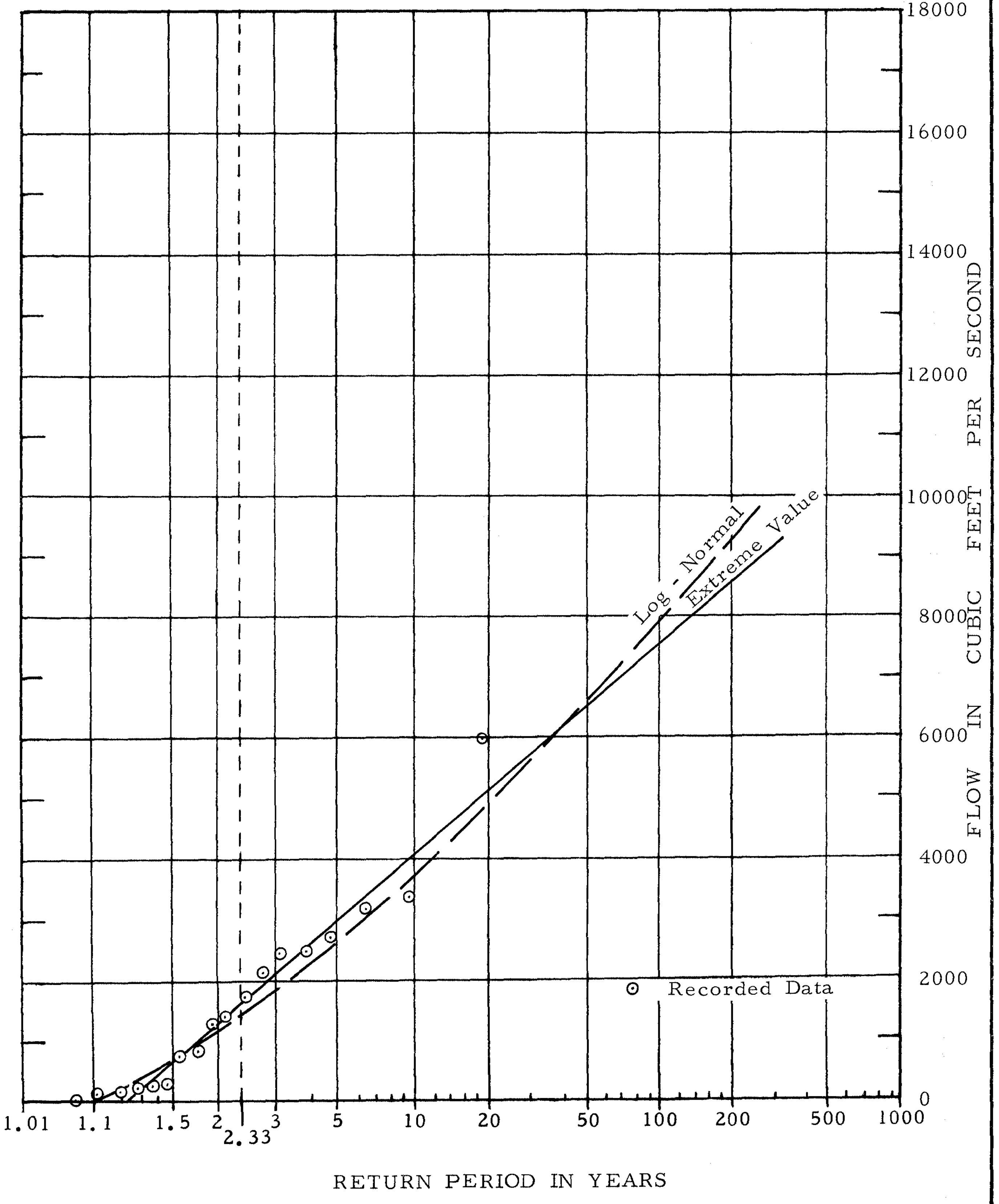

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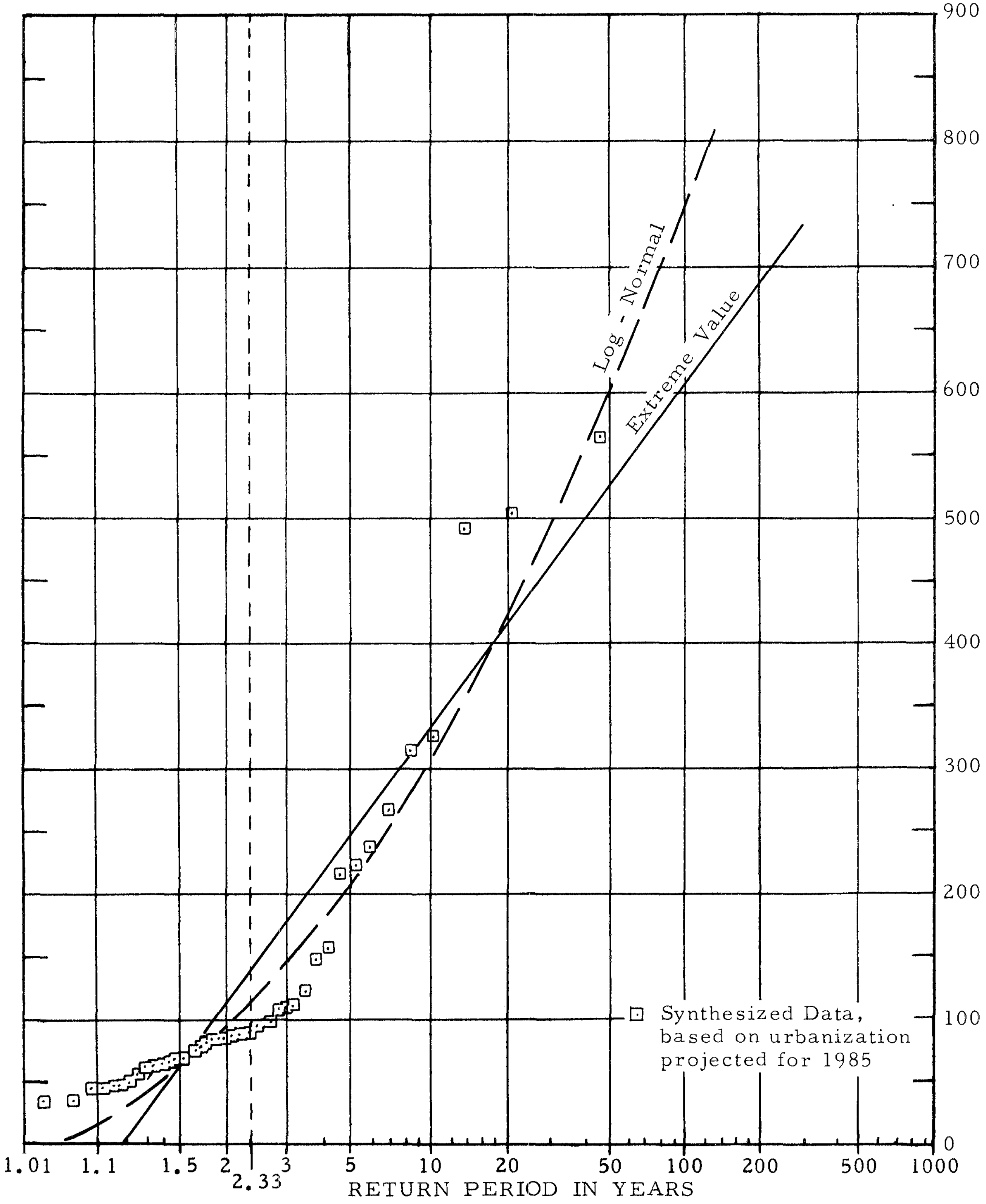
FIGURE 6-21

FREQUENCY CURVE
PEAK STREAMFLOW
Berryessa Creek at S.P.R.R. *



* record site "A", Synthesized streamflow data, Santa Clara County, SCCFCWD, 1964, being that portion of Berryessa Creek above its intersection with the Southern Pacific Railroad near Alum Rock.

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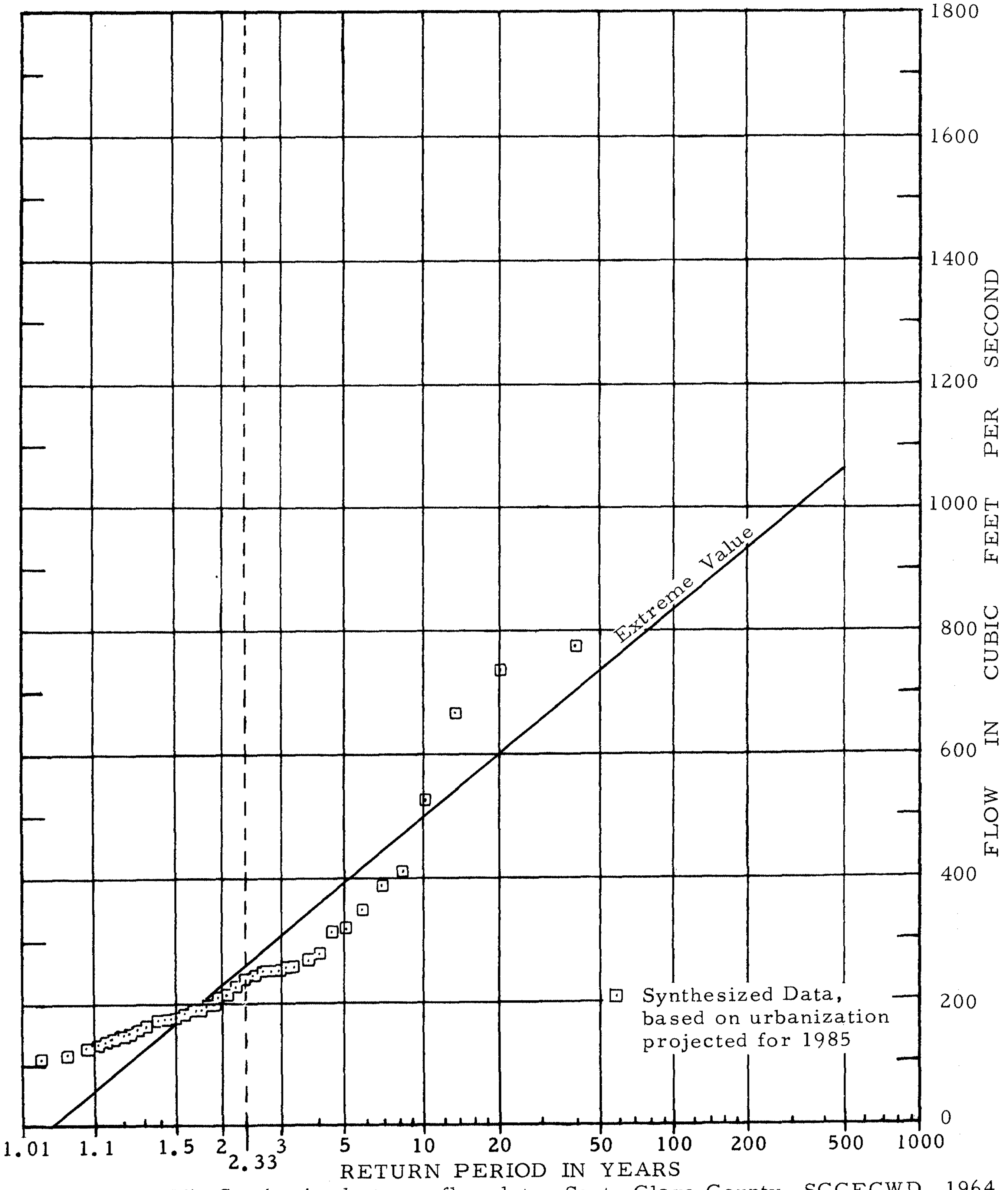
FIGURE 6-22

FREQUENCY CURVE
PEAK STREAMFLOW
Canoas Creek near San Jose *



* record site "B", Synthesized streamflow data, Santa Clara County, SCCFCWD, 1964, being that portion of Canoas Creek above a point approximately 0.6 mile above Hillsdale Avenue.

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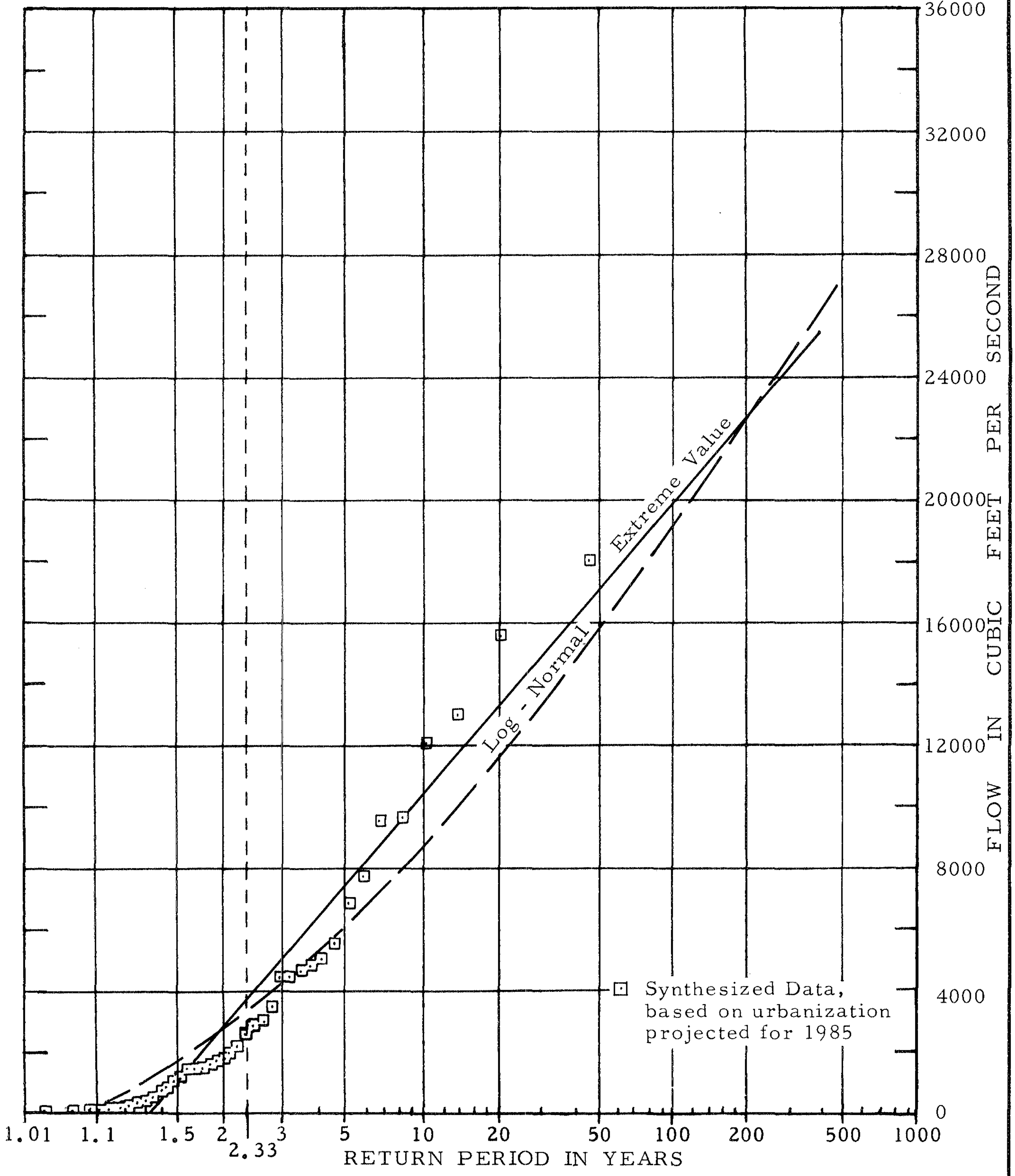
FIGURE 6-23

FREQUENCY CURVE
PEAK STREAMFLOW
Coyote Creek at Coyote Dam *



* record site "C", Synthesized streamflow data, Santa Clara County, SCCFCWD, 1964, being that portion of Coyote Creek above Coyote Dam spillway.

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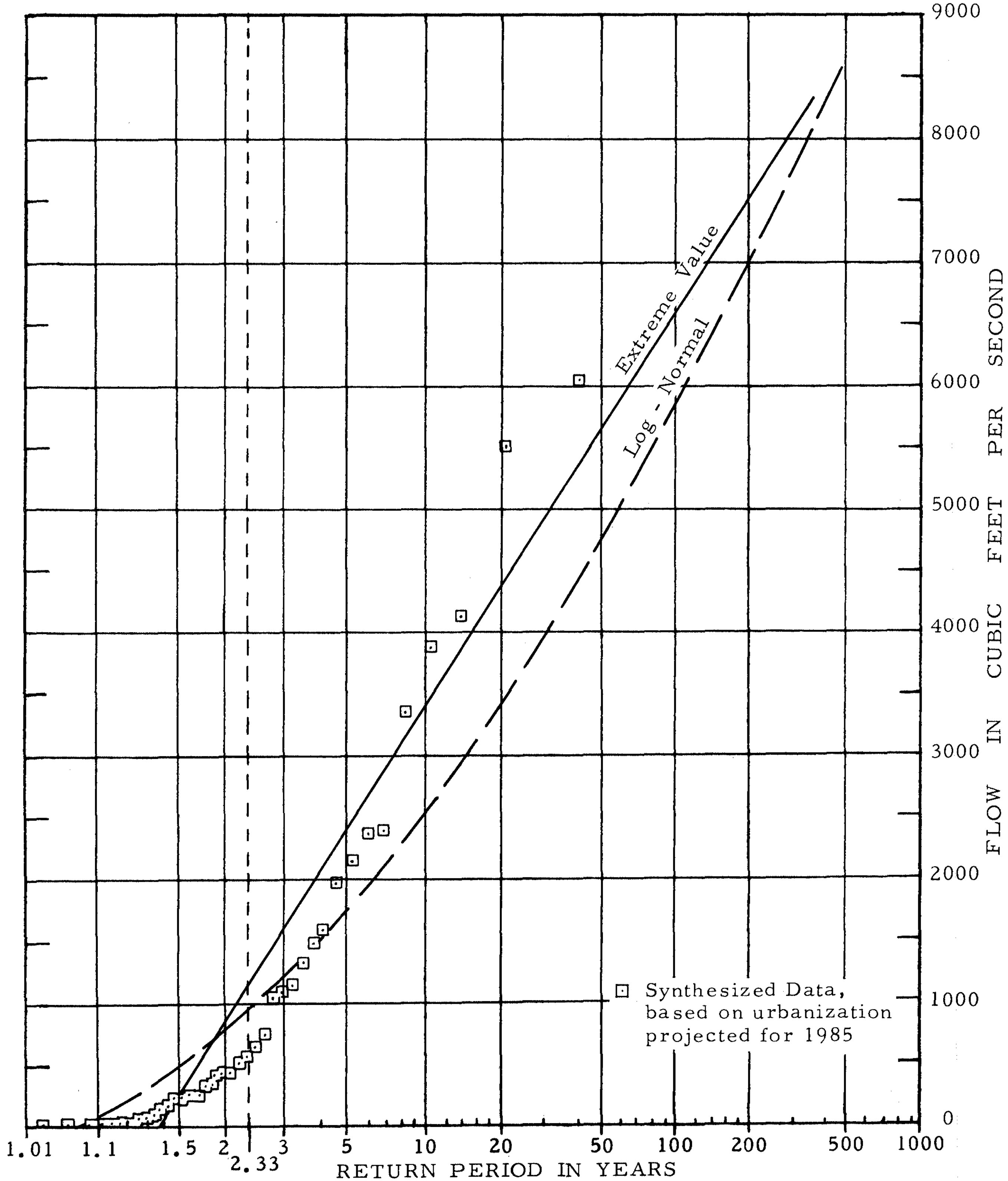
FIGURE 6-24

FREQUENCY CURVE
PEAK STREAMFLOW
Las Animas Creek above Anderson Dam *



* record site "H", Synthesized streamflow data, Santa Clara County, SCCFCWD, 1964, being that portion of Las Animas and San Felipe Creeks above a point approximately 0.9 mile downstream of their intersection.

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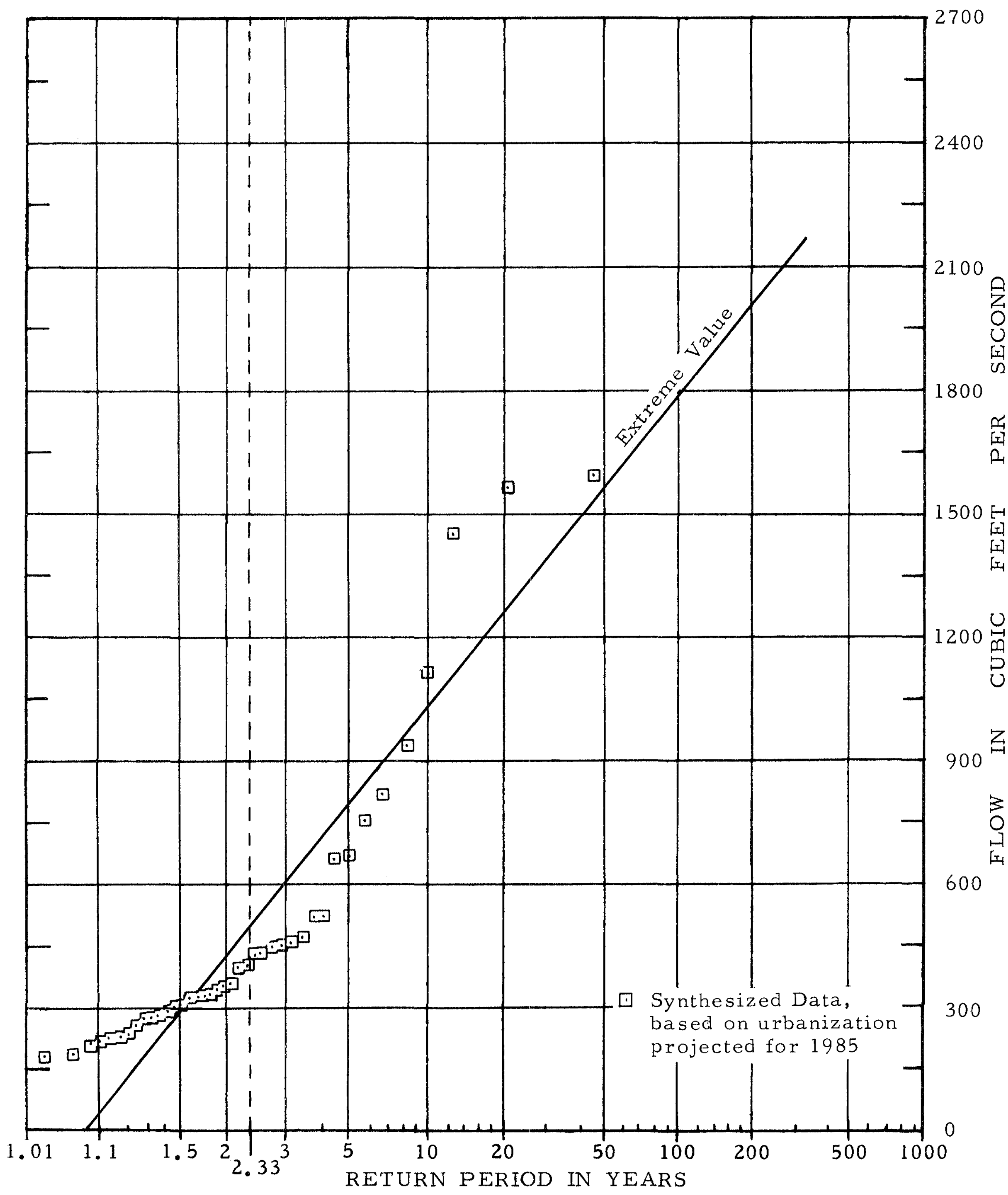
FIGURE 6-25

FREQUENCY CURVE
PEAK STREAMFLOW
Silver Creek near San Jose *



* record site "O", Synthesized streamflow data, Santa Clara County, SCCFCWD, 1964, being that portion of Silver Creek above its intersection with Bayshore Highway.

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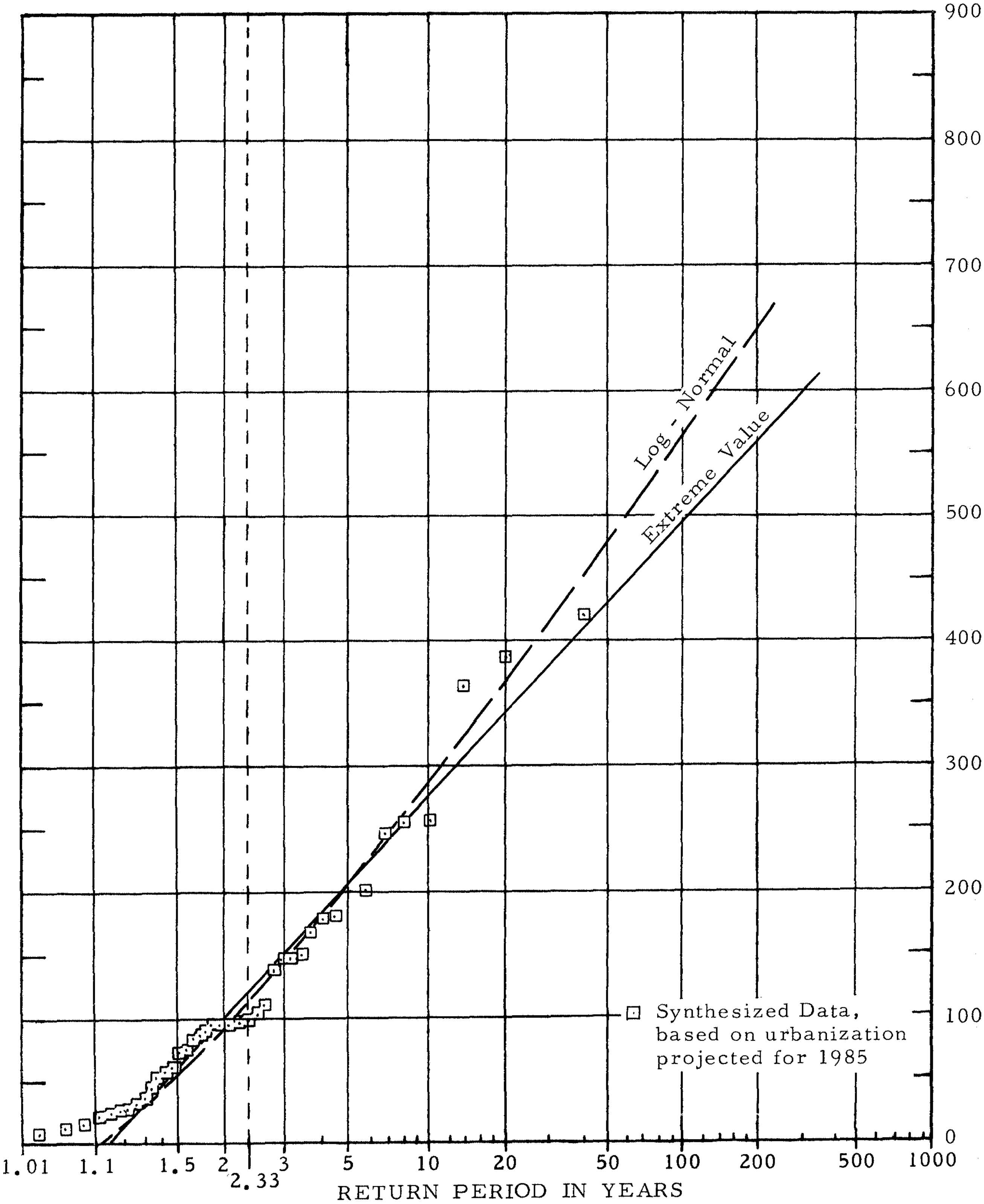
FREQUENCY CURVE
PEAK STREAMFLOW
Wildcat Creek at Saratoga-Los Gatos Road *



* record site "Q", Synthesized streamflow data, Santa Clara County, SCCFCWD, 1964, being that portion of Wildcat Creek above its intersection with Saratoga-Los Gatos Rd.

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FIGURE 6-27

FREQUENCY CURVE
PEAK STREAMFLOW
Regional Means

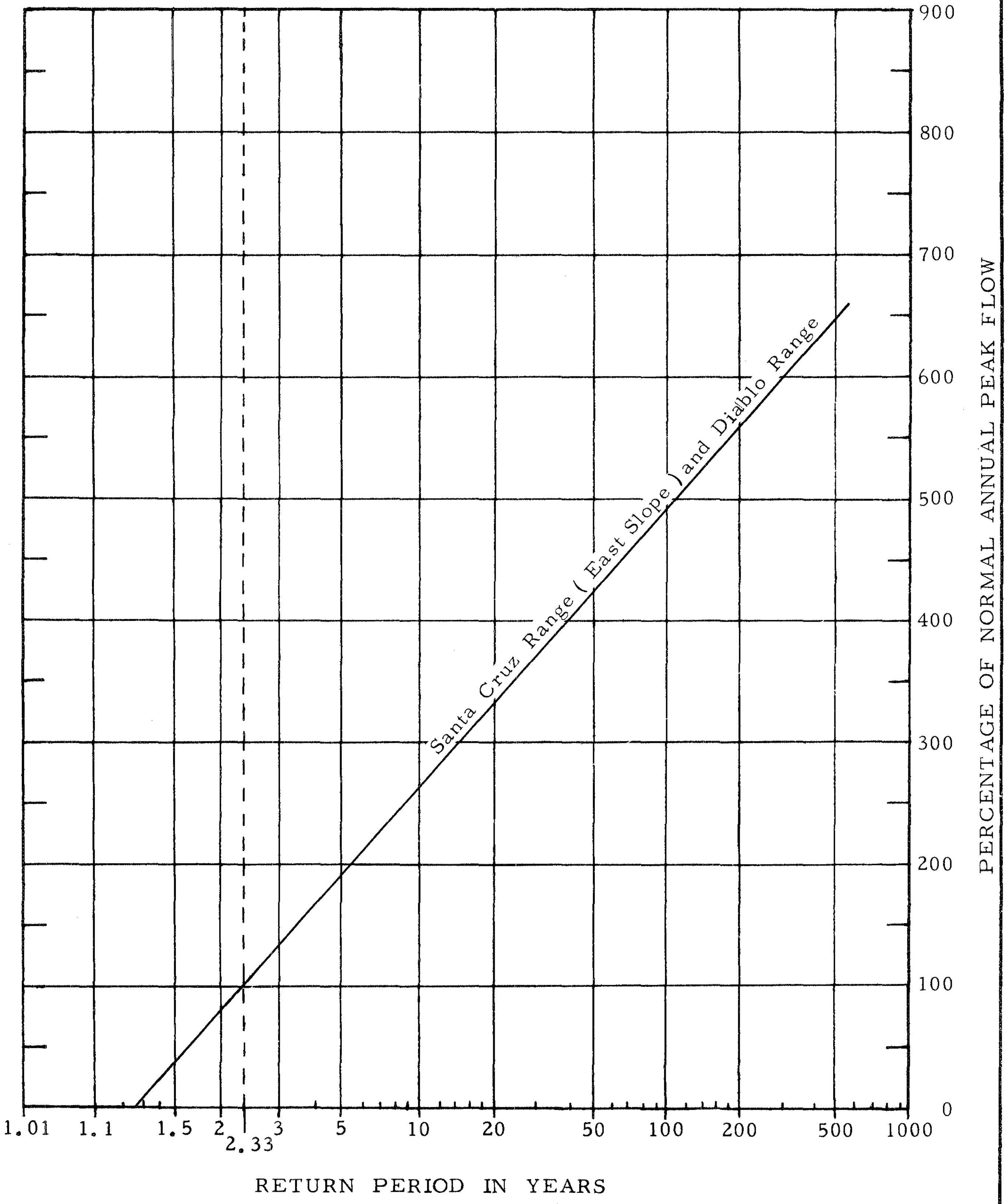

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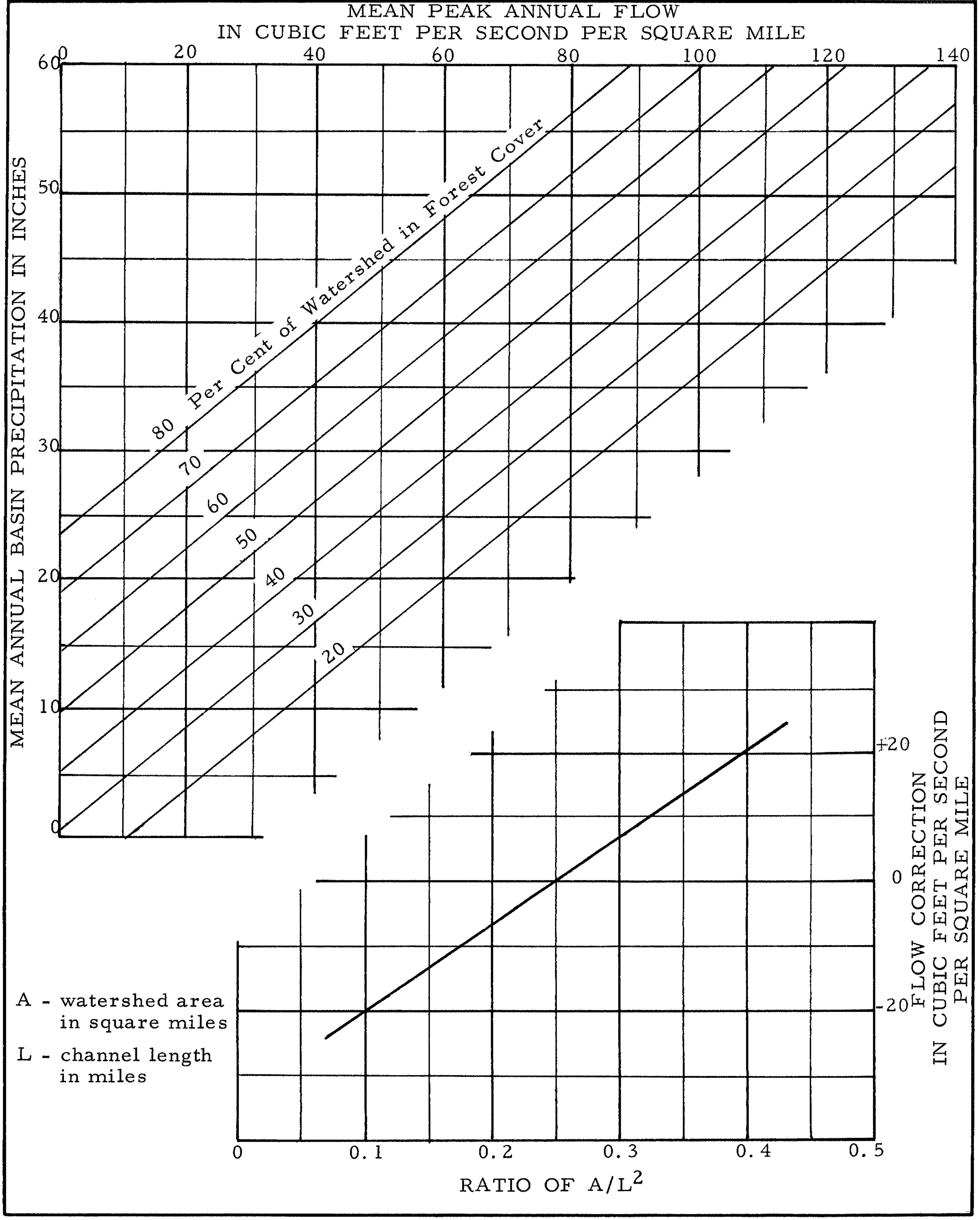
FIGURE 6-28

REGIONAL FLOOD FREQUENCY RELATIONS
Ungaged Watersheds


MEAN PEAK ANNUAL FLOW
IN CUBIC FEET PER SECOND PER SQUARE MILE
0
20
40
60
80
100
120
140
MEAN ANNUAL BASIN PRECIPITATION IN INCHES
60
50
40
30
20
10
0
80 Per Cent of Watershed in Forest Cover
70
60
50
40
30
20
+20
0
-20
FLOW CORRECTION
IN CUBIC FEET PER SECOND
PER SQUARE MILE
0
0.1
0.2
0.3
0.4
0.5
RATIO OF A/L²
A - watershed area in square miles
L - channel length in miles